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THE MARINE OBSERVER

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VOL. 59 **No. 305** **JULY 1989**

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COVER PHOTOGRAPH: A Dolphin Gull in adult summer plumage, taken in the Falkland Islands in 1988 by Captain D.J. Lloyd, Master, m.v. *West Moor*.

Letters to the Editor, and books for review, should be sent to the Editor, The Marine Observer, Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR

LONDON: HER MAJESTY'S STATIONERY OFFICE

EXCELLENT AWARDS 1988

A total of 1,117 ship's meteorological logbooks were received from Selected Ships and Offshore units of the U.K. Voluntary Observing Fleet during 1988. Each of these logs was checked and assessed in the Marine Division, and certain of them were awarded the marking of 'Excellent', taking into account all the factors contributing to the keeping of the best possible weather log under prevailing circumstances and conditions. This year there are a few more than the normal 300 names appearing in the Excellent Award lists that follow, reflecting the additional work commenced in September and undertaken by Officers in ten ships participating in the Voluntary Special Observing Project–North Atlantic. The extra groups compiled by these ships on specially printed log sheets are analysed and filed in the process of achieving the project's objectives of improving the accuracy of data used to generate marine weather forecasts.

Similarly to last year, we have pleasure in naming thirteen observing ships that received the five highest assessments:

1. m.v. *Harold La Borde*, Bibby Line Ltd, Captains J.R. Hughes and J.S. Gavin.
   s.s. *ACT 1*, Blue Star Ship Management Ltd, Captain R. Brownbill.
   m.v. *Hampshire*, Bibby Line Ltd, Captain P.S. Bytheway.
2. m.v. *Tokyo Bay*, P. & O. Containers Ltd, Captains J.M. Johnston and C.R. Short.
3. m.v. *Ivybank*, Bank Line Ltd, Captain I.M. Maden.
   m.v. *Wellington Star*, Blue Star Ship Management Ltd, Captain T.C. Black.
   m.v. *Southland Star*, Blue Star Ship Management Ltd, Captain C. Jackson.
4. m.v. *Graiglas*, Garth Shipping Co. Ltd, Captain C.M. Berkley.
   m.v. *Bello Folawiyo*, Ocean Fleets Ltd, Captain E.D. Somes.
   m.v. *Liverpool Bay*, P. & O. Containers Ltd, Captain R. Dinnie.
5. m.v. *Resolution Bay*, P. & O. Containers Ltd, Captain D.V. Harradine.
   m.v. *La Chacra*, Buries Markes Ship Management Ltd, Captain J.D. Robinson.
   m.v. *Botany Bay*, P. & O. Containers Ltd, Captain D.B. Morris.

It seems inevitable that the highest accolades are bestowed mainly upon the observers and communicators of ships of the most prestigious companies, but a glance at the lists opposite will show a gratifying response from many other ships whose work is just as deserving of Excellent Awards and is equally meritorious as those at the top.

As to the awards themselves, the chosen book to be sent to those receiving their third or more awards is *The Reader's Digest Book of Facts*, 1988 reprint with amendments. Also selected is the *Collins Atlas of the World*, which we hope will be enjoyed as much as the previous alternatives, and *Longman's Concise English Dictionary*. This particular reference work had not been considered in the past, but we think it is an excellent dictionary and one ideally suited to the mariner with an awareness of the importance of providing us with accurate and punctual weather data.

J.F.T.H.

EXCELLENT AWARDS (Year ended 31 December 1988)

Captain	Company
C.E. Banks	P. & O. Ferries Ltd
L.R. Bell	Denholm (I.O.M.) Ltd
C.M. Berkley	Graig Shipping plc
D.L. Beveridge	Dept of Agr. & Fish. for Scotland
T.C. Black	Blue Star Ship Management Ltd
J.K. Blackburn	P. & O. Containers Ltd
D. Boon	Geest Line Ltd
P.N. Bowden	Shell Ship Management Ltd
R. Brownbill	Blue Star Ship Management Ltd
J.A. Buchanan	B.P. Shipping Ltd
P.S. Bytheway	Bibby Line Ltd
J.D. Cannan	J. Marr & Son Ltd
W.C. Carruthers	P. & O. Containers Ltd
A.J. Cheshire	Blue Star Ship Management Ltd
A.J. Chivers	Blue Star Ship Management Ltd
A.J. Clarke	Zapata Marine Services Ltd
J.A. Coffin	Graig Shipping plc
M.J. Cole	British Antarctic Survey
R.A. Cole	Geest Line Ltd
I.W. Collister	P. & O. Containers Ltd
J.A. Cosker	P. & O. Containers Ltd
J.W. Cottier	Greenpeace
P.J. Creber	Furness Withy (Shipping) Ltd
C.E.P. Crofton	Buries Markes (Ship Management) Ltd
B. Cushman	P. & O. Containers Ltd
I.W. Crane	Gardline Shipping Ltd
D.K. Dickson	Dept of Agr. & Fish. for Scotland
R.D. Dinnie	P. & O. Containers Ltd
R.W.H. Dole	Jebsens Ship Management Ltd
P.C. Dyer	Zapata Marine Serices Ltd
P.J. Elder	Bank Line Ltd

Captain	Company
J.S. Ellis	Caledonian MacBrayne Ltd
A.T. Ferrier	Caledonian MacBrayne Ltd
S.F. Findlay	Caledonian MacBrayne Ltd
G. de F. Foster	Geest Line Ltd
J.R. French	Ministry of Agriculture, Fisheries & Food
J.S. Gavin	Bibby Line Ltd
M.J.R. Godbehear	P. & O. Containers Ltd
M.R. Godfrey	P. & O. Ferries Ltd
F.K. Gordon	B.C.P. Ship Management Ltd
I.S. Grant	P. & O. Containers Ltd
B. Hanssom	Ship Link Ltd
T.J. Morcom-Harneis	Blue Star Ship Management Ltd
D.V. Harradine	P. & O. Containers Ltd
L.E. Howell	P. & O. Containers Ltd
J.R. Hughes	Bibby Line Ltd
R. Hutchison	Caledonian MacBrayne Ltd
J.H. Hutson	P. & O. Containers Ltd
C. Jackson	Blue Star Ship Management Ltd
E.L. Jackson	Cunard Ellerman Shipping Services Ltd
N.D.T. Johnson	Blue Star Ship Management Ltd
J.M. Johnston	P. & O. Containers Ltd
R.H. Jones	Denholm (I.O.M.) Ltd
T.F. Jones	Ropner Shipping Co. Ltd
A.W. Kinghorn	Blue Star Ship Management Ltd
D.M. Kissane	Cunard Ellerman Shipping Services Ltd
R.H. Lancaster	Denholm (I.O.M.) Ltd
S.J. Lawrence	British Antarctic Survey
D.R. Llewellyn	Furness Withy (Shipping) Ltd
D.J. Lloyd	Denholm (I.O.M.) Ltd
S.S. Lockhart	Dept of Agr. & Fish. for Scotland
I.M. Maden	Bank Line Ltd

Excellent Awards (*contd*)

Captain	Company	Captain	Company
P.J.R. Manson	P. & O. Containers Ltd	C.R. Short	P. & O. Containers Ltd
J.Y. McAlpine	B.P. Shipping Ltd	D. Skillander	T. & J. Harrison Co. Ltd
A.C. McNab	London & Overseas Freighters plc	K.M.R. Skinner	Geest Line Ltd
E.M. Meare	E. & F. Shipping Management Ltd	D.J. Sloan	Shell Ship Management Ltd
S.R. Montague	B.P. Shipping Ltd	E.D. Somes	Ocean Fleets Ltd
D.B.C. Norris	P. & O. Containers Ltd	T.M. Stones	B.P. Shipping Ltd
D.V. Newlin	Blue Star Ship Management Ltd	W.R. Strevens	Furness Withy (Shipping) Ltd
T.T. Nixon	B.P. Shipping Ltd	C.E.W. Sturcke	OOCL Ltd
A.J. Palmer	P. & O. Containers Ltd	R.B. Tarbuck	London & Overseas Freighters plc
N. Passey	Cunard Ellerman Shipping Services Ltd	C.O. Thomas	Bibby Line Ltd
J.G. Paterson	Cable & Wireless plc	J.D. Thomson	P. & O. Containers Ltd
J. Peacock	Caledonian MacBrayne Ltd	J.F. Thomson	B.P. Shipping Ltd
P.G. Pinkerton	E. & F. Shipping Management Ltd	D.J. Tyler	Britship (I.O.M.) Ltd
A.A. Railton	P. & O. Containers Ltd	R.B. Wade	Graig Shipping plc
D.L. Rattray	Dept of Agr. & Fish. for Scotland	S.A. Walker	Ben Line Steamers Ltd
E.T. Rees	Bank Line Ltd	P.J. Walters	Mobil Shipping Ltd
J.D. Robinson	Buries Markes (Ship Management) Ltd	E.J. Watterson	Ocean Fleets Ltd
J.J. Robinson	E. & F. Ship Management Ltd	G. Watson-Wood	Graig Shipping plc
A.G. Rothery	Wallem S.M.S. (I.O.M.) Ltd	B. Walmsley	Furness Withy (Shipping) Ltd
R.P. Royan	P. & O. Containers Ltd	R.T. Wood	P. & O. Containers Ltd
P.A. Sambrook	P. & O. Containers Ltd	G.W. Wostenholme	Britship (I.O.M.) Ltd
R.A. Shopland	P. & O. Ferries Ltd		

Principal Observing Officer	Company
S. Allen	Geest Line Ltd
P.R. Anderson	B.P. Shipping Ltd
G.R. Armstrong	Bank Line Ltd
K.J.B. Ball	Furness Withy (Shipping) Ltd
J. Barkess	Dept of Agr. & Fish. for Scotland
M. Barraclough	P. & O. Containers Ltd
J.C. Barton	Dept of Agr. & Fish. for Scotland
C.A. Bates	Buries Markes (Ship Management) Ltd
C.J. Batty	P. & O. Containers Ltd
M.L. Bechley	P. & O. Ferries Ltd
A.W. Bissaker	Bibby Line Ltd
R.A.C. Bourne	Denholm (I.O.M.) Ltd
P. Brown	Shell Ship Management Ltd
N.D.J. Butler	Blue Star Ship Management Ltd
N. Campbell	Denholm (I.O.M.) Ltd
P.A. Carmichael	Ocean Fleets Ltd
B.A. Chapman	Minst. of Agr. Fish & Food
J.M. Clark	London & Overseas Freighters plc
N.W. Conquest	Jebsens Ship Management Ltd
A.R. Davidson	Dept of Agr. & Fish. for Scotland
J. Davies	J. Marr & Son Ltd
G.M. Davis	P. & O. Containers Ltd
D.L. Dodsworth	P. & O. Containers Ltd
M.P. Donnelly	Dept of Agr. & Fish. for Scotland
S.G. Dougal	Cunard Ellerman Shipping Services Ltd
J.H. Duncan	Caledonian MacBrayne Ltd
J.P. Dunne	B.P. Shipping Ltd
A.C. Dunnings	Denholm (I.O.M.) Ltd
C. Durmam	Shell Ship Management Ltd
V.A. Egan	P. & O. Containers Ltd
T.E. Evans	Geest Line Ltd
S. Fish	Ben Line Steamers Ltd
P.J. Flanagan	P. & O. Containers Ltd

Principal Observing Officer	Company
D.B. Flood	Blue Star Ship Management Ltd
S.G. Fraser	Graig Shipping plc
N.E. Gardiner	P. & O. Containers Ltd
M.R. Gover	Graig Shipping plc
J.W. Graham	Gardline Shipping Ltd
R.A. Graham	Greenpeace
A.J.T. Gray	Caledonian MacBrayne Ltd
K.M. Gregg	B.P. Shipping Ltd
N.D.L. Gregory	P. & O. Containers Ltd
D.E. Grief	Zapata Marine Services Ltd
C.M. Grimmett	Blue Star Ship Management Ltd
G.N. Hale	P. & O. Containers Ltd
C.N. Hardy	Bank Line Ltd
D. Harnett	Cable & Wireless plc
P.J. Harrison	Ocean Fleets Ltd
A. Haynes	Bank Line Ltd
G.T. Hobbs	British Antarctic Survey
E.J. Hooper	Geest Line Ltd
M.J. Hume	Bibby Line Ltd
M.K. Jelfs	Shell Ship Management Ltd
P. Johnson	P. & O. Containers Ltd
C.W. Jones	OOCL Ltd
K.M. Keith	Zapata Marine Services Ltd
M.E. Lacey	Bibby Line Ltd
J.S. Latto	Blue Star Ship Management Ltd
J.M. Latus	P. & O. Ferries Ltd
P.D. Lazzell	Blue Star Ship Management Ltd
A.M. Leech	P. & O. Containers Ltd
M.N. Mace	Blue Star Ship Management Ltd
C.N.A. Macey	Mobil Shipping Ltd
P.V. Marshall	Furness Withy (Shipping) Ltd
W.M. Maugham	P. & O. Containers Ltd
I.B. McCaskie	Caledonian MacBrayne Ltd

Excellent Awards (*contd*)

Principal Observing Officer	Company
J.L. McCorquodale	Furness Withy (Shipping) Ltd
G.D. Mead	P. & O. Containers Ltd
J.P. Meade	P. & O. Containers Ltd
C.R. Merry	P. & O. Containers Ltd
A.H. Morbey	Buries Markes (Ship Management) Ltd
B.P. Murphy	Denholm (I.O.M.) Ltd
P.J. Neve	Blue Star Ship Management Ltd
G.D. Nicholls	Shell Ship Management Ltd
L.M. O'Keefe	Caledonian MacBrayne Ltd
S.H. Pearce	P. & O. Containers Ltd
W.M. Perkin	B.P. Shipping Ltd
A.J. Pointing	Wallem S.M.S. (I.O.M.) Ltd
M.S. Prestt	B.P. Shipping Ltd
D. Rogers	P. & O. Containers Ltd
B.L. Rolf	P. & O. Containers Ltd
B.A. Ryan	E. & F. Shipping Management Ltd
J.L. Rydell	Ship Link Ltd
A.J. Sharpe	T. & J. Harrison Co. Ltd
R.I. Sime	Britship (I.O.M.) Ltd
P.S. Sinclair	Blue Star Ship Management Ltd
Rakesh K. Singh	B.C.P. Ship Management Ltd
C.J. Slade	Graig Shipping Ltd
N.B. Solanki	E. & F. Shipping Management Ltd
P.A. Squance	Cunard Ellerman Shipping Services Ltd
M.C.P. Sutcliffe	P. & O. Containers Ltd
N.C. Tewari	Cunard Ellerman Shipping Services Ltd
R.W. Thomson	Graig Shipping Ltd
J.W. Tricket	P. & O. Ferries Ltd
C.K. Urwin	P. & O. Containers Ltd
M.G. Vanstone	Furness Withy (Shipping) Ltd
V.K. Vijayan	E. & F. Shipping Management Ltd
D.B. Waddingham	Britship (I.O.M.) Ltd
S.L.J. Walker	Bibby Line Ltd
M.J. Webber	London & Overseas Freighters plc
D.C. Collins-Williams	P. & O. Containers Ltd
J.D. Williams	Geest Line Ltd
T.G. Wilson	Caledonian MacBrayne Ltd
M.A. Worsnop	Bibby Line Ltd
P. Wylie	Ropner Shipping Co. Ltd

Radio Officer	Company
N.M. Abbott	Curnow Shipping Co. Ltd
A.J. Anderton*	Mobil Shipping Ltd
G.E.J. Bailey	S.T. & C. International Marine Ltd
R.E. Haviland	Shell Ship Management Ltd
P.I. Hillman*	P. & O. Ferries Ltd
C.W. Hodgson	P. & O. Containers Ltd

J.G.L. Baker	... ...	Marconi International Marine Co. Ltd
D.E. Beech	... ...	Cunard Ellerman Shipping Services Ltd
M.N. Beeley*	... ...	Britship (I.O.M.) Ltd
D.G. Bevan	... ...	Buries Markes (Ship Management) Ltd
A.S.T. Beveridge*	... ...	Dept of Agr. & Fish. for Scotland
P. Birt	... ...	Marconi International Marine Co. Ltd
J. Blaylock	... ...	Shell Ship Management Ltd
C.R. Bolton	... ...	Ocean Fleets Ltd
R.A. Browne	... ...	Ocean Fleets Ltd
T.J. Browne	... ...	Acomarit (U.K.) Ltd
B. Brycki	... ...	B.P. Shipping Ltd
A. Bystedt	... ...	Ship Link Ltd
C.S. Carver	... ...	Radio & Electronic Services Ltd
J.C. Chatwin	... ...	Radio & Electronic Services Ltd
P.G. Corkin	... ...	Furness Withy (Shipping) Ltd
W.H. Coventry	... ...	P. & O. Containers Ltd
P.A. Lindley-Curtis	... ...	Geest Line Ltd
R.A. D'Souza	... ...	P. & O. Ship Management Ltd
D. Divgi	... ...	E. & F. Shipping Management Ltd
P.M. Dolphin	... ...	P. & O. Containers Ltd
J. Donnan	... ...	Geest Line Ltd
Wong Chu Fai	... ...	Denholm (Hong Kong) Ltd
R.A. Fernandes	... ...	E. & F. Shipping Management Ltd
D.S. Flemington	... ...	P. & O. Containers Ltd
N.C. French	... ...	P. & O. Containers Ltd
M.J. Gamble	... ...	Shell Ship Management Ltd
K.J. Gaughan	... ...	P. & O. Containers Ltd
S.F. Gomez	... ...	B.C.P. Ship Management Ltd
V.A. Gorney	... ...	P. & O. Containers Ltd
M.G. Hancock*	... ...	Denholm (I.O.M.) Ltd
M.R.T. Hannan	... ...	P. & O. Containers Ltd
N.W. Harrison	... ...	Myhre Havtor (U.K.) Ltd
D. Hart	... ...	Gateway Shipping Ltd
P.D. Hartwell	... ...	B.C.P. Ship Management Ltd
P.M. Haslam	... ...	S. T. & C. International Marine Ltd
N.C. Horner*	... ...	Denholm (I.O.M.) Ltd
A.D. Hutchinson	... ...	P. & O. Containers Ltd
D. Jakobaufderstroht	... ...	London & Overseas Freighters Ltd
M.J. Janor	... ...	S.T. & C. International Marine Ltd
G. Jeremiah	... ...	B.P. Shipping Ltd
G.W. Keane	... ...	Quadrant Marine Services Ltd
C.L. Keeble	... ...	Marconi International Marine Co. Ltd
J.H. Kell	... ...	Graig Shipping plc
D.A. Kelsall	... ...	P. & O. Containers Ltd
S.J. Kirkwood	... ...	Marconi International Marine Co. Ltd
R.C. Knott	... ...	S.T. & C. International Marine Ltd
P.R. Lacock	... ...	Quadrant Marine Services Ltd
D. Lawrence	... ...	London & Overseas Freighters Ltd
J.D.C. Lawrie	... ...	Bank Line Ltd
J.G. Lyttle	... ...	P. & O. Containers Ltd
I.A. MacDonald*	... ...	Zapata Marine Services Ltd
E. Mackenzie	... ...	P. & O. Containers Ltd
H.A. Mackenzie*	... ...	Dept of Agr. & Fish. for Scotland
N. Marwood	... ...	S. T. & C. International Marine Ltd
P.A. Mathews	... ...	P. & O. Containers Ltd
B.W. Matten	... ...	P. & O. Containers Ltd
K.P. McCarthy	... ...	Wallem S.M.S. (I.O.M.) Ltd
A.R.B. McCormick	... ...	Graig Shipping plc
M.I. McGregor	... ...	Geest Line Ltd
I. McKendrick*	... ...	Dept of Agr. & Fish. for Scotland
S.J. Mee	... ...	British Antarctic Survey
D.B. Millar	... ...	P. & O. Containers Ltd
A.D. Moore	... ...	Wallem S.M.S. (I.O.M.) Ltd
H.G. Moran	... ...	S. T. & Co. International Marine Ltd
D.J. Murray	... ...	Graig Shipping plc
A.J. Pampling	... ...	S.T. & C. International Marine Ltd
P.I. Pegg	... ...	P. & O. Containers Ltd
D.R. Pickler	... ...	Blue Star Ship Management Ltd
P.G. Popple	... ...	Jebsen Ship Management Ltd
P. N. Pouchet	... ...	Bibby Line Ltd

Excellent Awards (*contd*)

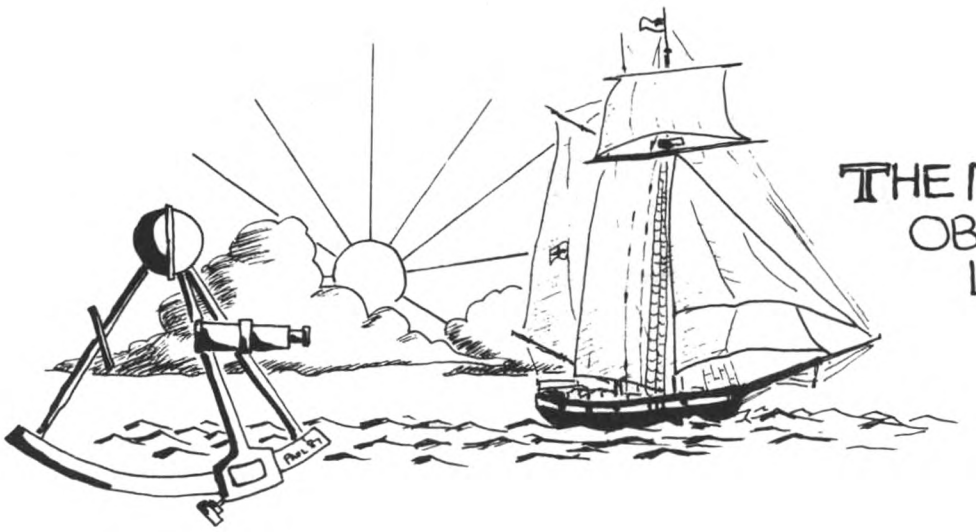
Radio Officer	Company	Radio Officer	Company
P.R. Prophet	Geest Line Ltd	C.K. Thornalley	P. & O. Containers Ltd
I.D. Rodrigues	P. & O. Ship Management Ltd	A. Titley	P. & O. Containers Ltd
M.B. Ryan	Shell Ship Management Ltd	B.S. Unnithan	Cunard Ellerman Shipping Services Ltd
W.K. Salandy	Bibby Line Ltd	C. Wade	Bibby Line Ltd
K. Scott*	Gardline Shipping Ltd	A.R. Watt	Wallem S.M.S. (I.O.M.) Ltd
G.J. Simpson*	Bibby Line Ltd	P. White	Marconi International Marine Co. Ltd
L.T. Simpson*	P. & O. Ferries Ltd	T.W. White*	Britship (I.O.M.) Ltd
Baldev Singh	B.C.P. Shipping Ltd	T.J. Whitworth*	Zapata Marine Services Ltd
D.C. Smith	Denholm (I.O.M.) Ltd	B.G. Wilkinson	P. & O. Containers Ltd
T.J. Smith	P. & O. Containers Ltd	M.E. Wilson	Cable & Wireless plc
D. Stapleton	Bibby Line Ltd	R.A. Wilson	Curnow Shipping Co. Ltd
E.B. Stephenson	P. & O. Containers Ltd	D. Woollan	Greenpeace
R. Stewart	Marconi International Marine Co. Ltd	J.F. Worcester	Radio & Electronic Services Ltd
W.F.P. Swann	Jebsen Ship Management Ltd	J.C. Yates	S.T. & C. International Marine Ltd
D.W. Temple*	Dept of Agr. & Fish. for Scotland		

'MARID' SHIPS†

Captain	Principal Observing Officer	Radio Officer	Company
F. Clayton	J.A. Dunlop	J. Aspinall*	Esso Petroleum Co. Ltd
R.C. Lakeman-Turner	S.D. O'Toole	R.J. Quale*	ARC Marine Ltd
H.J. Pope	R.W. Hemming	R. Andrews*	United Marine Aggregates Ltd

* Deck Officer.

† Vessels recruited for the purpose of observing and transmitting sea temperatures with non-instrumental observations in the North Sea.



THE MARINE OBSERVERS' LOG

July, August, September

The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

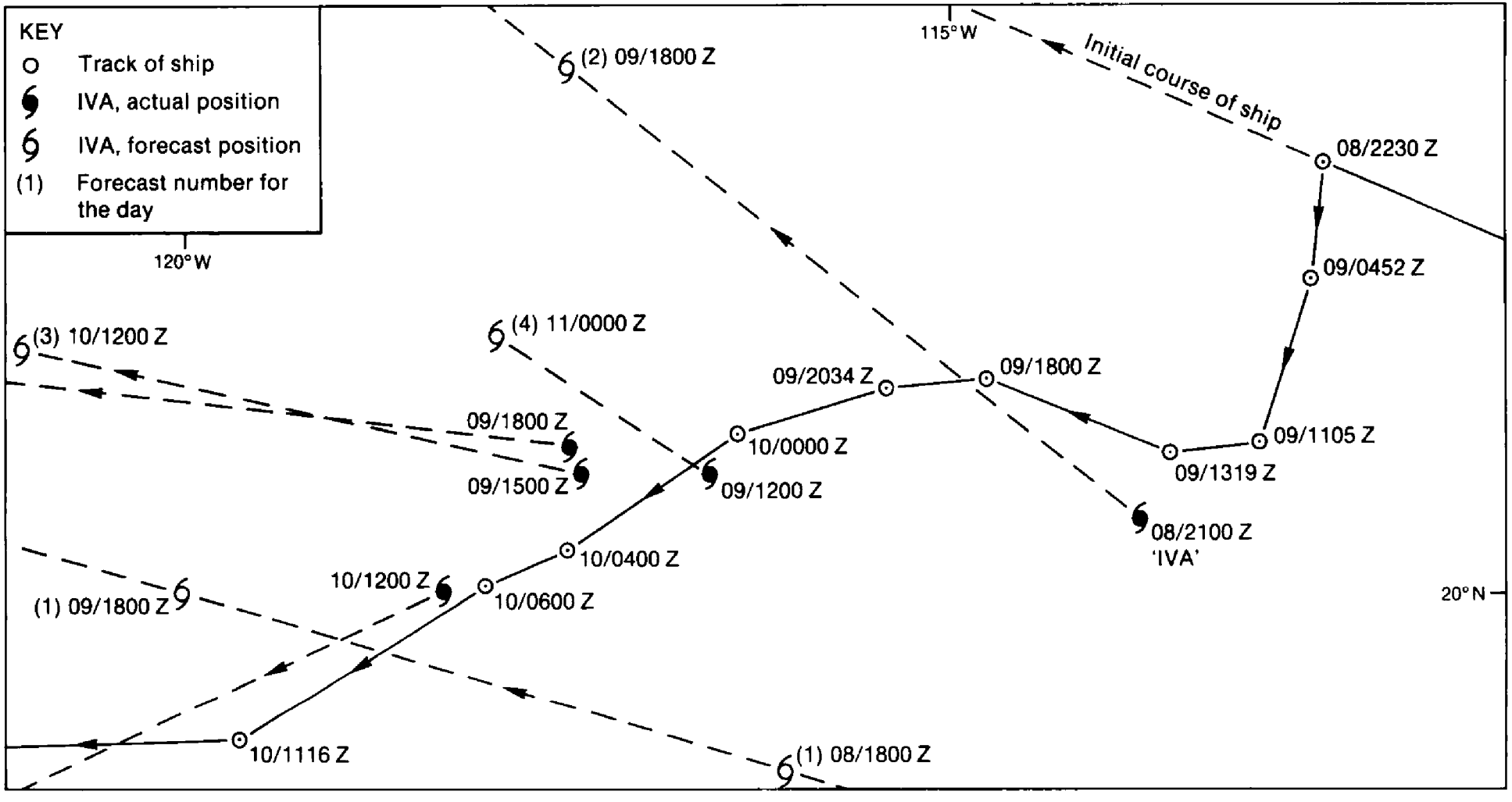
HURRICANE 'IVA'

Eastern North Pacific

m.v. *Lerma*. Captain J.S. Pearsall. Manzanillo to Guam. Observers: the Master, Mr G.P. Eyles, Chief Officer, Mr C.A. Aguirre, 3rd Officer and ship's company.

7–10 August 1988. The vessel departed Manzanillo at 1500 GMT on the 7th at which time Iva, designated a tropical storm, was located near 18° N, 111° W. Information received on the 8th recommended routeing via Cape San Lucas, then Great Circle. Further information received on this day from the National Weather Service, San Fransisco, (NWS) upgraded Iva to a hurricane, moving north-west at 13 knots and located at 20.5° N, 113.8° W at 2100. The recommendation for the vessel was for it to head south-south-west at reduced speed, or even stopping to allow Iva to pass at least 150 n.mile to the west. The following observations and the chartlet tell their own story; all positions are those of the ship unless otherwise stated.

8th	2200:	Alter course to 180°. Reduce speed to 40 r.p.m.
9th	0000:	Wind ESE'ly, force 4. Pressure 1008.6 mb.
	0452:	Alter course to 200°. Increase speed to 70 r.p.m. Position 21° 51'N, 112° 36'W.
	0600:	Wind SE×E'ly, force 4. Pressure 1011.1 mb.
	1105:	Alter course to 260°. Increase to full sea speed. Position 20° 58'N, 112° 57'W.
	1200:	Wind SE×S'ly, force 3. Pressure 1008.5 mb.
	1319:	Alter course to Great Circle track 289°. Position 20° 52'N, 113° 31'W.
	1800:	Wind SE'ly, force 3. Pressure 1010.3 mb. Information received at 1500 located Iva at 20.8° N, 117.5° W, moving west at 11 knots. Recommended routeing was for rhumbline to Guam. Alter course to 255°.


KEY
Track of ship
IVA, actual position
IVA, forecast position
(1) Forecast number for the day
120°W
115°W
20°N
Initial course of ship
08/2230 Z
09/0452 Z
09/1105 Z
09/1319 Z
09/1800 Z
09/2034 Z
10/0000 Z
09/1200 Z
08/2100 Z
'IVA'
(2) 09/1800 Z
(3) 10/1200 Z
09/1800 Z
09/1500 Z
(4) 11/0000 Z
10/0400 Z
10/1200 Z
10/0600 Z
(1) 09/1800 Z
10/1116 Z
(1) 08/1800 Z

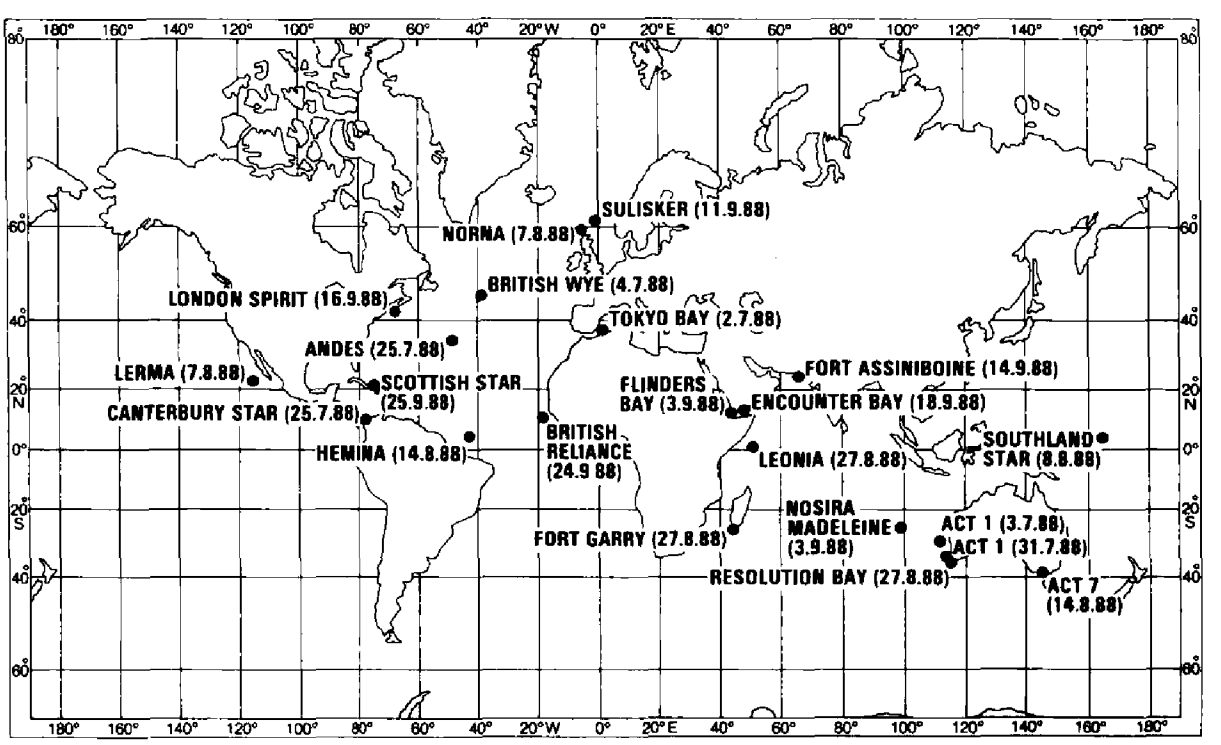
2034: Alter course to 240°. Position 21° 14′N, 115° 31′W.
2300: Iva located at 20.9° N, 117.4° W, moving west-by-north at 10 knots.
10th 0000: Wind SE'ly, force 6–7. Pressure 1003.2 mb
0300: Wind E×N'ly, force 5. Pressure 997.4 mb, dry-bulb temperature 24.4 °C. Overcast with intermittent light drizzle.
0400: Wind increases to N'ly, force 11. Position 20° 18′N, 117° 30′W.
0600: Wind N'ly, force 8–9. Pressure 1003.0 mb.
0700: Wind NW×N'ly, force 8. Pressure 1006.7 mb.
1116: Alter course to 267° for Guam. Wind decreasing, pressure increasing.

A high seas synopsis at 1200 on the 10th located Iva at 20.1° N, 118.5° W, moving south-west at 5 knots. By plotting the co-ordinates of the storm throughout the period, it was found that the vessel must have passed close to the centre of it. Iva, by this time downgraded to a tropical storm, continued in a south-westerly direction before dissipating.

Position of ship at 2200 GMT on the 8th: 22° 30′N, 112° 30′W.

Position of ship at 1116 GMT on the 10th: 19° 06′N, 119° 38′W.

[Note. The routeing advice referred to above was not supplied by the U.K. Meteorological Office].



Position of ships whose reports appear in *The Marine Observers' Log.*

WATERSPOUT

North Atlantic Ocean

m.v. *Andes*. Captain B. Walmsley. Cristobal to Amsterdam. Observers: Mr A.W. Jones, 2nd Officer, Mr N.T. Wiggins, 3rd Officer and Mr A.L. Dobson, Radio Officer.

25 July 1988. At 1215 GMT whilst the ship was on a course of 052° at a speed of 18.0 knots, a waterspout was seen to be forming, and was watched doing so for about five minutes. It appeared to spiral down out of the base of a cloud approximately 5 n.mile away on the starboard bow. The spout did not actually reach sea level before dissipating, but at its most developed stage it formed a dark, almost black, thin funnel from the cloud base (estimated at 1,500 feet), gradually becoming lighter in colour until it was almost invisible and also much wider at about 30 m above the sea. The spout travelled along with the cloud for about eight minutes in a south-westerly direction, before rapidly dissipating. During the spout's most developed phase, the water directly beneath it was choppy with some wave crests observed. The surrounding sea was rippled and apparently unaffected. The duration of the spout was approximately 15 minutes, yet in this time it travelled about 4.1 n.mile although the wind force was only 1 or 2.

Weather conditions at the time were: air temperature 26.6 °C, wet bulb 23.6, sea 29.4, pressure 1029.3 mb, wind variable, force 1–2.

Position of ship: 35° 18′N, 48° 09′W.

Note. Mr M. Rowe, of the Tornado and Storm Research Organisation, comments:

'This is a good description, with several features of interest. The speed of travel of the waterspout (something that is not often mentioned in such reports) indicates that the spout was moving at the speed of the wind at cloud level, not at the surface. The paler colour of the lower part of the spout is because the lower relative humidity of the air at that level resulted in less condensation taking place within the funnel.'

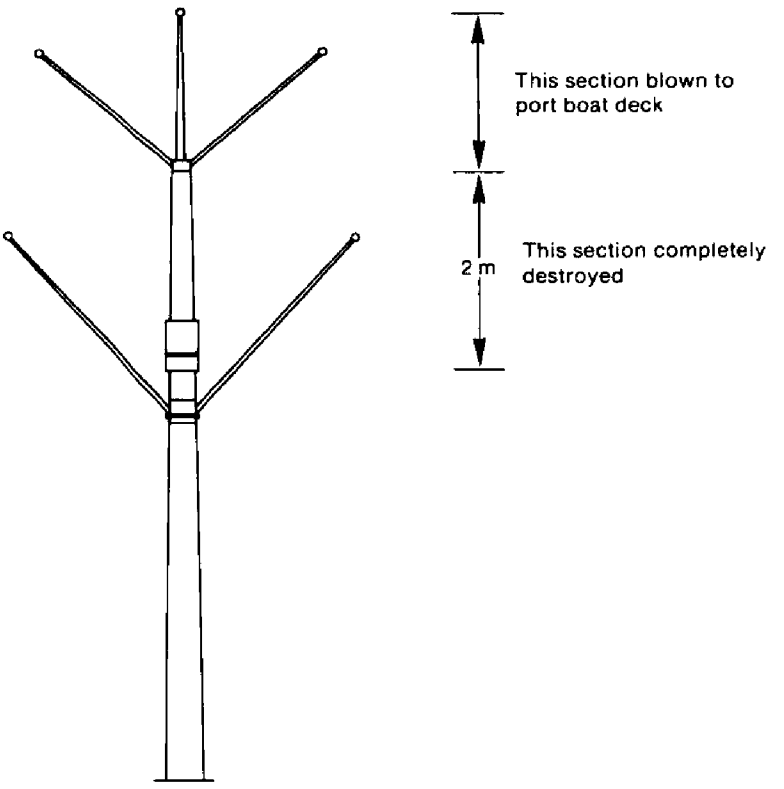
LIGHTNING

Caribbean Sea

m.v. *Canterbury Star*. Captain J.M.-Harneis. Port Manatee to Turbo. Observers: the Master and Mr S. Warry, SM1A.

25 July 1988. At 0458 GMT, whilst the ship was on a course of 149°, the main transmitting ship aerial was struck by lightning; also damaged was the satellite navigator aerial.

The strike broke the whip aerial, which was of fibreglass construction, at a point about five or six metres above deck level, where, at the metal joint, four side aerials are fitted. The affected parts are shown in the sketch. The top section of the aerial was blown to the boat deck, with pieces of fibreglass being strewn over the port bridge wing and port boat deck. A large 'bang' echoed around the vessel, together with a small 'thud' as the aerial hit the boat deck.



After the strike, the magnetic compass was found to be reading 10° high, indicating induced magnetism. Very large cumulonimbus clouds were present at the time, and frequent heavy rain showers had been encountered.

Weather conditions were: air temperature 28.5 °C, wet bulb 26.5, pressure 1014.3 mb, wind light and variable.

Position of ship: 09° 10′N, 77° 25′W.

BILLOW CLOUDS

Eastern North Atlantic

f.p.v. *Norna*. Captain S.S. Lockhart. Patrol duties in northern and western Scottish waters. Observers: the Master, Mr J. Barkess, First Officer and Mr J. Munn, Seaman.

7 August 1988. A distant, saw-tooth pattern of cloud was observed at 1700 GMT, in a layer of altocumulus and altostratus at an altitude of 10° and bearing 020°–065°.

Photographs [one of which is shown opposite page 129] were taken at 1710. The pattern of cloud drifted eastward and dissolved at about 1720 between bearings 045° and 095°. For the next three hours, the cloud cover remained as 7 oktas of altocumulus and altostratus with featureless patches and small areas of more turbulent cloud, but no regular patterns were observed.

Weather conditions at the time were: air temperature 13.1 °C, wet bulb 12.7, pressure 1019.3 mb, wind S×E'ly, force 3.

Position of ship: 59° 51′N, 05° 28′W.

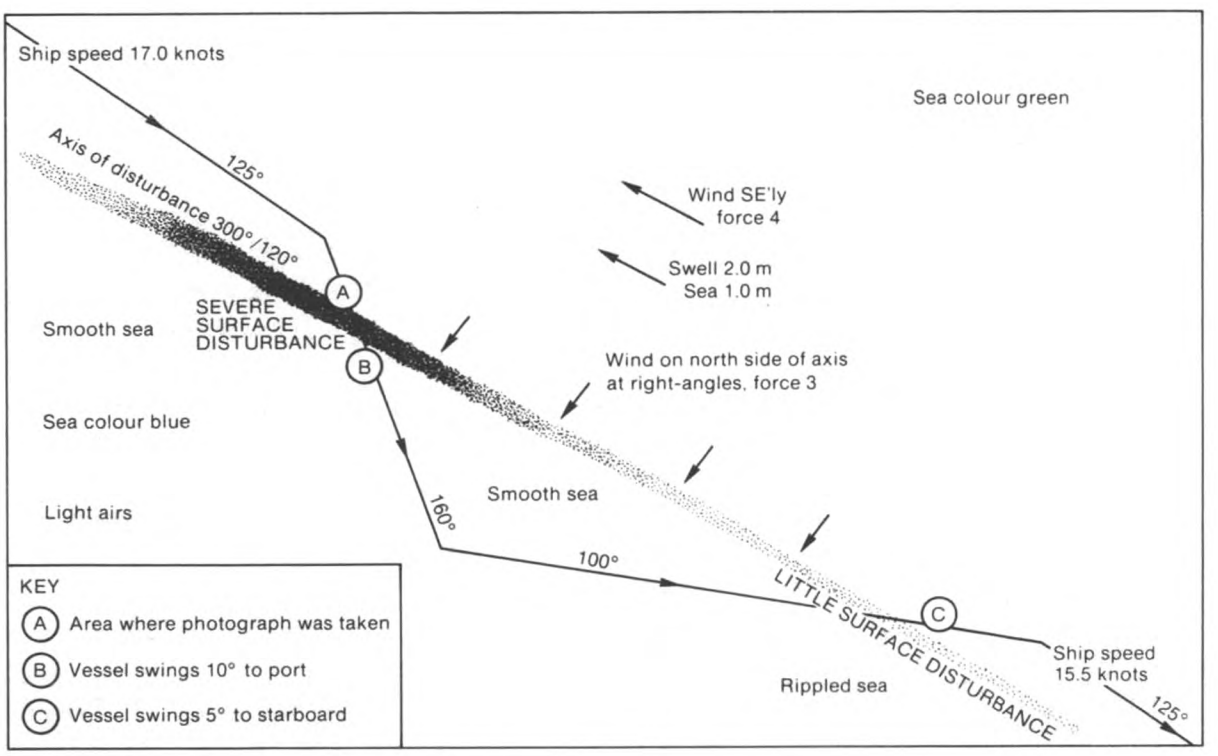
CURRENT SHEAR

Equatorial Atlantic

m.v. *Hemina*. Captain G.J. Pearson. Mississippi to Richards Bay. Observers: the Master, Mr I.D. Gordon, 2nd Officer and ship's company.

14 August 1988. At 1200 GMT the vessel was proceeding along a course of 125° with the wind gradually increasing to SE'ly, force 4.

By 1230 a sea-surface disturbance could be seen ahead of the vessel, and at 1235, a current rip with a clearly-defined shear line was observed. The vessel was closing on the shear line at an acute angle, so the course was altered to 160° which would let the vessel pass through the disturbance at a greater angle, see sketch.



The sea temperature immediately ahead of the disturbance was 29.0 °C and the surface colouration was of a predominantly green hue. The vessel's log indicated a speed of 16.1 knots.

Upon crossing the shear line, the vessel's head swung 10° to port for a few minutes before returning to 160° as the autopilot compensated. The ship was then in smooth water, and the decision to cross the shear line again was taken. At this point, the sea temperature was 28.8 and the water colour was a deep blue. A photograph taken at point 'A' on the sketch, is shown opposite page 117.

As the ship approached the shear line for a second crossing, the disturbance became less pronounced. On this occasion, the heading swung 5° to starboard, and the initial course of 125° was regained with the log reading 15 knots. The axis of the shear line lay approximately 300° / 120°, while the line of disturbed water was estimated to be between 12 n.mile and 15 n.mile long. At the time of the observations, the *Hemina* was 550 n.mile north-east of the Amazon River.

In conclusion, it was generally agreed that this current shear indicated a meeting of the Equatorial Counter Current and the South Equatorial Current

(reference the change in log speed). The previous 24 hours saw the *Hemina*'s speed increase from 15.5 knots to 17 knots as the Equatorial Counter Current was advantaged.

Interestingly, it was noted that the Amazon Ridge lay immediately to the south-west and ran almost parallel to the shear line between 06° N, 45° W and 04° N, 41° W.

Position of ship at 1235 GMT: 05° 22′N, 42° 46′W.

Note. Mr J.B. Clark, of the Ocean Current section, Meteorological Office, comments:

'The causes of these effects are rather complex, with three factors appearing to be involved. Firstly, in the neighbourhood of the ship's course at the time, a branch from the north-west going South Equatorial Current turns sharply clock-wise into the east going Equatorial Counter Current. Secondly, salinity decreases northward, from about 36 parts per thousand to 35.5 parts between about 4° N and 7° N at that longitude. Thirdly, in consequence, water density also decreases northward in this area.

'Thus the most likely explanation, bearing in mind the 'blue' colour of the water south of the line and the 'green' colour north of it, is that a convergence zone had formed where the more saline, denser, blue oceanic water of the South Equatorial Current tended to sink beneath the less saline, less dense, green coastal water of the Equatorial Counter Current which originated near the Orinoco.'

SEA TEMPERATURE

Gulf of Aden

m.v. *Flinders Bay*. Captain R. Brinkworth. Fremantle to Piraeus. Observers: the Master, Mr R.J. Pearson, 2nd Officer, Mr J. Thompson, Radio Officer and Mr D. Dunn, SM1.

3 September 1988. At 0600 GMT as the vessel was approaching the Straits of Bab el Mandeb, a large amount of marine life was observed. It was estimated that a school of between 200 and 250 Common Dolphins was present, and at least two whales were spotted although it was not possible to identify the species. The dolphins and whales were heading in a north-westerly direction at about 5 knots.

On completing the 0600 met. observation, the sea-water temperature was taken by bucket, and was recorded as 24.1 °C, this showing an apparent drop of 7 degrees over the previous six hours. This temperature was checked again by bucket, and was also verified with the engine-room intake. All checks concurred.

It was assumed that this comparatively low sea temperature was caused by an upwelling of cold water. Cold water currents, or such an abundance of marine life had not been detected in this area before.

Position of ship: 12° 30′N, 43° 54′E.

Note 1. Mr J.B. Clark comments:

'In summer, the current off the south coast of the Arabian peninsula normally sets east-north-east with high constancy and mean rate of 1 knot, although 3 knots may be reached at times (Admiralty Pilot No. 64). Conditions are, therefore, favourable for upwelling here, and if it occurs, will cause a fall in the sea-surface temperature. The nutrients contained in the upwelled water would then attract whales and dolphins.'

Note 2. Mr D.A. McBrearty, of the Dolphin Survey Project, comments:

'Large aggregations of dolphins are frequently seen and are usually temporary occurrences associated with a sudden abundance of food. The change in water temperature may well have concentrated schools of small fish in the area which would provide prey species for the dolphins.'

WHALES

Western North Atlantic

m.v. *Scottish Star*. Captain D. Newlin. Cristobal to Newark, N.J. Observer: Mr R.D. Brown, 2nd Officer.

25 September 1988. At about 1800 GMT a small whale with calf was observed swimming slowly away from the side of the vessel at a distance of approximately 10 m.

The adult was very dark brown in colour and had a small fin placed well back on the narrow body. It had a tapered beak with a small melon, giving the impression of a neck and there was a lighter patch on the cheek. There was a large tail fin, and the whale was about 4.5 m long.

If it was a Gulf Stream Beaked Whale, then no tooth was noticed, nor was any scarring on the back seen. The white patch at the navel was unobservable and no sizeable blow was noticed. The whale surfaced approximately every 10 seconds with its beak out of the water and its dorsal fin breaking the surface but not the tail. The calf swan alongside the parent and was half its length; it did not sound, even in the vessel's wake.

Position of ship: 20° 15'N, 73° 55'W.

Note. Mr D.A. McBrearty comments:

'This was quite obviously a beaked whale, probably a Mesoplodon, although which particular member of the genus is almost impossible to tell without close examination. It is possible that this was a specimen of Gervais' Beaked Whale* (*M. europaeus*) as the observer has suggested, but then Blainville's Beaked Whale (*M. densirostris*) is also a possibility. As for the apparent absence of teeth in the larger whale, this is not surprising because the teeth of the female Mesoplodonts do not errupt through the gum and are, in general, visible only in a prepared skull. (*This is the common name in general use for this particular whale.)'

Indian Ocean

m.v. *Fort Garry*. Captain J.W. Rogers. Mauritius to Durban. Observers: the Master, Mr J.H. Arton, Chief Officer, Mr S. Mundy, 2nd Officer and Mr L. Attri, 3rd Officer.

27 August 1988. Between sunrise and sunset, whilst the vessel was transiting the Banc de l'Etoile at the southern tip of Madagascar, it was at all times accompanied by an unusually large number of whales. At any one time there were up to 16 in sight, and over the whole period, it was calculated that the observers saw approximately 300 to 400 in total; all of the sightings occurring whilst the vessel was actually on the bank. Once the vessel had crossed the bank, only two more whales were observed in the deeper waters off it. At the same time, small, concentrated shoals of fish were seen, so it was assumed that the bank was rich in food and that the whales were engaged in feeding, taking no notice as the vessel passed. All the whales were sighted in family groups of up to four, many with obvious young, and only one or two being seen on their own.

From their general outline and the size and shape of their flippers, it was deduced that the majority of the creatures were Humpback Whales. Often, they could be seen slapping their flippers on the water, and this gave a good view of the sucker-like lumps on the leading edge of the flipper. However, having recently seen Killer Whales at Sea World in Florida, the Chief Officer was certain that

Opposite page 116

ACT 1 (Blue Star Ship Management Ltd) Captain R. Brownbill

Hampshire (Bibby Line Ltd) Captain P.S. Bytheway

Photos by Skyfotos Ltd

Harold La Borde (Bibby Line Ltd) Captains J.R. Hughes and J.S. Gavin

THREE OF THE SHIPS WHICH GAINED THE HIGHEST MARKS FOR THEIR METEOROLOGICAL LOGBOOKS DURING 1988. (See page 102.)

Opposite page 117

Photo by I.D. Gordon

Current shear photographed from m.v. *Hemina*. (See page 114.)

Photo by Captain R. Brownbill

Southern Skua executing in-flight refuelling from s.s. *ACT* 1. (See page 120.)

there was a number of these whales among the others. Unfortunately, they were at distances greater than 2 n.mile, but the Master confirmed their identification.

Throughout the whole day, the whales of both species put on a spectacular display of acrobatics, leaping out of the water before smashing back down in a welter of spray, whilst others rose vertically from the sea before falling back into it. Some were seen to be 'surfing', that is, ploughing along with their heads just above the water. One Humpback put on such a show that at first it was thought to be doing battle with a giant octopus, but closer examination revealed that what first appeared to be one of the tentacles was, in fact, the flippers of the whale showing in turn as it made complete 360-degree rolls, slapping its limbs down on the surface each time they entered the water.

Whilst all the observers had seen large schools of whales before, it was agreed that never before had so many been seen over such a long period of time, nor had anyone seen two species of whale alongside each other showing no animosity.

Position of ship: approximately 26° 00′S, 45° 20′E.

Note. Mr D.A. McBrearty comments:

'This sea area is a well-known summer ground for Humpbacks and Right Whales which migrate up from the Southern Ocean during the austral winter. The observers were indeed fortunate to be crossing the banks at this time and to have witnessed such a display. It is quite possible that Killer Whales (*Orcinus orca*) were present as believed. Although Killer Whales feed largely on fish, it is well known that they also take small dolphins, seals and sealions where the opportunity arises. Many of the whales seen would be about to give birth at this time and a new-born calf is vulnerable; a concerted attack by Killer Whales on a calf would, I believe, be more than likely.'

FISH

Mediterranean Sea

m.v. *Tokyo Bay*. Captain C.R. Short. Port Said to Southampton. Observers: the Master, Mr M. Leech, 2nd Officer and ship's company.

2 July 1988. At 0930 GMT a large fish was seen leaping from the water and twisting in the air. The fish was about 90 cm to 120 cm in length, having a dark upper side and silver undersides, with a very narrow tail. It was thought to be a tunny.

There was frenzied activity for some three minutes, although only one fish was seen, and it did not appear to be feeding. Each time, after launching itself, it landed in the water on its side, as though trying to make as big a splash as possible. Could this activity have been attributable to the attempted removal of parasites?

Position of ship: 37° 00′N, 02° 45′E.

Note. Dr F. Evans, of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments:

'Large, powerful fish do leap from the water and fall back noisily on their sides from time to time and it is supposed that they are indeed trying to remove parasites, although it is not certainly so. Parasites on the skin are probably not the problem; it is more likely to be the numerous louse-like creatures (parasitic copepods) attached to the gills that induce the leaping. They cling tenaciously to the gills with hooked legs and suck blood from the gill filaments. A hearty smack of water at the sea surface might serve to remove some of them. Some fish solve the difficulty by allowing other, smaller fish to enter the gill chamber and clean them off, to the mutual advantage of both fish.'

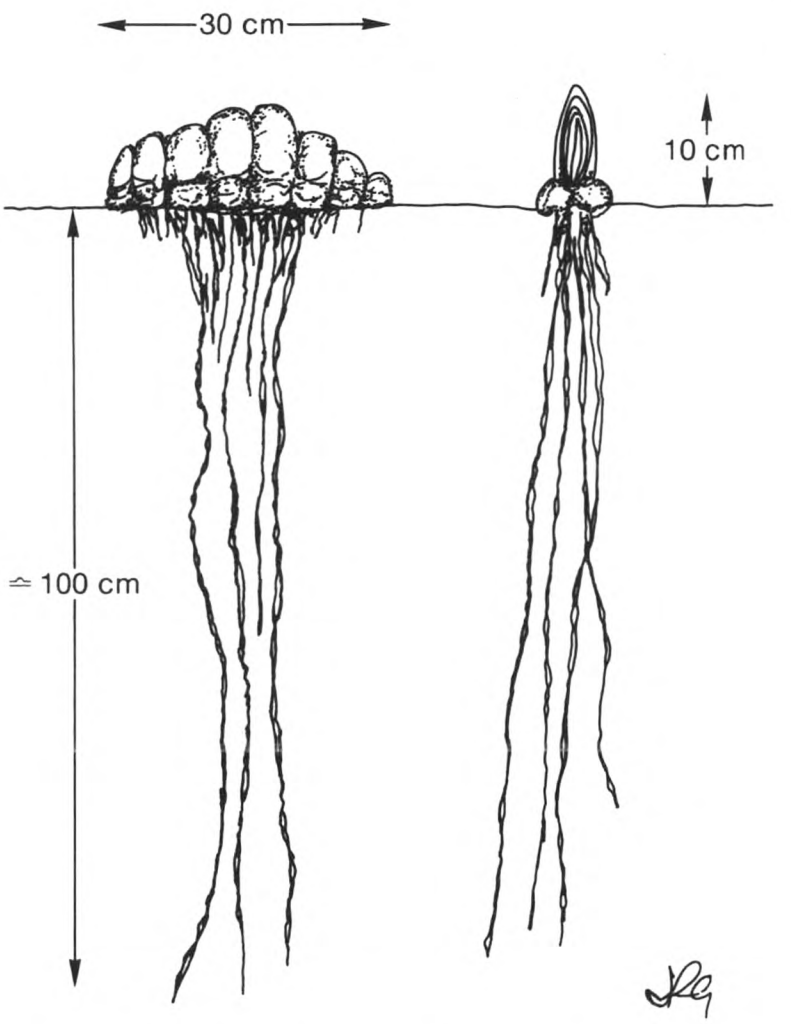
MARINE LIFE

Western North Atlantic

m.v. *British Wye*. Captain P.F. Robinson. Augusta to Montreal. Observers: the Master, Mr J.R. Gipson, Chief Officer, Mr D.J. Buckley, 2nd Officer, Mr M. Carlin, S2 and ship's company.

4 July 1988. During the morning, weather and ice reports received for the Grand Banks area off Newfoundland determined that an alteration of course from 267° to 250° would be prudent. This would keep the vessel in the influence of the Gulf Stream, avoid the southern limit of icebergs and delay any encounter with fog. From 0800 GMT to 1800, the sea temperature rose and the sky cleared. The wind had dropped to force 2 and was astern, and, with the sun shining after a week of overcast skies, the ship's company 'took the airs'.

On the 4–8 watch in the evening, all those persons enjoying the warmth of the sun were treated to many differing observations. First came the Portuguese man-of-war in large numbers; their sizes varied, but the average dimensions are shown in the sketch, some were noticed which may have been perhaps twice that



size. They were all assumed to have come from the Gulf of Mexico, travelling with the prevailing current and winds. Their colour was pink/purple, becoming a darker shade at water level, and their sails resembled prophylactic material. Together with these, occasional pieces of weed were observed, being yellow ochre in colour and about 1 m long, with nodules on the thin, straggly lengths.

Whales were also seen, but they were either too distant or seen for merely an instant, thus preventing identification. A school of about 20 (Bottlenose?) dolphins was seen some 3–5 n.mile north. These put on a fine display of leaping in what appeared to be an area of 'boiling' water. This behaviour was put down to them having found a shoal of fish, and they were making more than just a meal of these.

After a week of dull weather and seas of a rough nature, this watch proved a pleasant contrast.

Position of ship at 2000 GMT: 45° 30'N, 39° 30'W.

Note. Dr F. Evans comments:

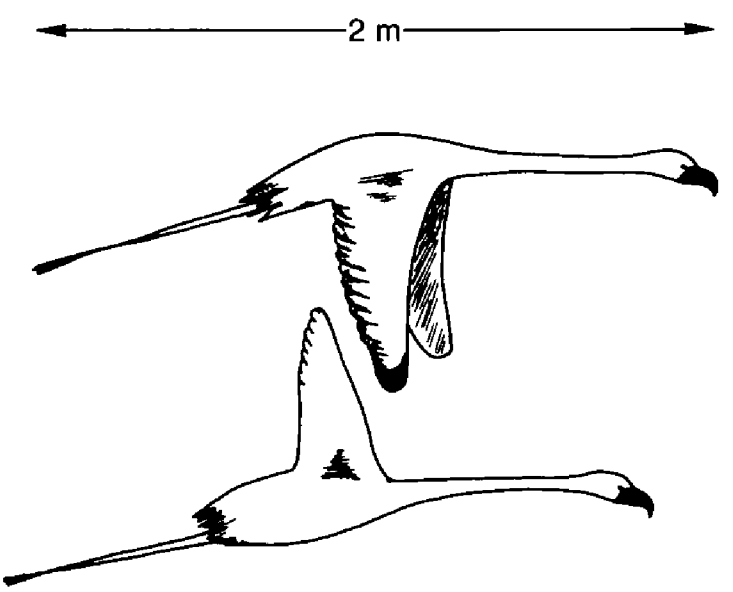
'I am grateful for this report of the Portuguese man-of-war (*Physalia*), it is the most common animals that are the most important. They are important just because they are common. Reporting only rarities gives a very false impression of what is happening with living creatures at sea.'

BIRDS

Eastern North Atlantic

m.v. *British Reliance*. Captain P.A. Darlow. Juaymah to Antifer. Observers: Mr A.D. Wilcock, 2nd Officer and Mrs G. Wilcock.

24 September 1988. At 1415 GMT as the vessel was heading north off the west coast of Africa, a flamingo was sighted circling the ship. The bird, shown in the sketch, appeared to be approximately 2 m long, was a bright, salmon pink with



flashes of very dark pink on the underside of the wings. The tips of the wings were black, as were their trailing edges, and the legs were an orange/pink colour, whereas the bill was black and curved downwards.

The flamingo circled the ship three or four times, flying with quick beats of the wing, then left, flying towards the north-east.

Position of ship: 10° 13'N, 18° 00'W.

BIRDS

Indian Ocean

s.s. *ACT 1.* Captain R. Brownbill. Port Chalmers to Jeddah. Observers: the Master, Mr K. Lumby, Chief Officer, Mr S. Rathbone, 2nd Officer, Mr N.D. Butler, 3rd Officer and Mr R. Knott, Radio Officer.

31 July 1988. At 0830 GMT when the ship was some 12 n.mile off Cape Leeuwin, two seabirds were noted accompanying the vessel and were identified as Southern Skuas by the book *Seabirds of Britain and the World* by Tuck and Heinzel. One bird regularly came close to the bridge wing, and when bread was offered from this point, at arm's length over the ship's side, it carefully manoeuvred and skilfully (but unhurriedly) took the bread from the hand, as shown in the photograph opposite page 117. It showed no fear, and on one ocasion allowed the Master to 'tickle' its chest.

The same bird took bread many times and was fairly unconcerned by the group of people watching its tricks. Whilst regularly successful at taking the food, it then frequently lost it while trying to position the bread in the beak for eating. The other bird, although obviously interested, did not seem prepared to undertake the difficult manoeuvre to come so close to the ship and a human.

The speed of the ship was 19 knots, and the true wind was a point forward of the beam, about force 3. The skua would only perform the manouevre on the windward side and would not come down to the leeward bridge wing.

Position of ship: 34° 30'S, 114° 56'E.

Indian Ocean

m.v. *Nosira Madeleine.* Captain M.A. Gater. Bunbury to Suez. Observers: Mr D.R. Hilton, 3rd Officer, Mr D. Johnston, Radio Officer and Mrs B. Johnston.

1–3 September 1988. Between these dates a Southern Skua followed the ship; its body was about 60 cm long and its wing-span was about 150 cm. The Radio Officer's wife had been tempting the bird with pieces of bread, but the skua was unable to land owing to various wires, aerials and structural obstacles around the bridge wing.

On 2 September at 1845 GMT the Third Officer was on the bridge wing to estimate the wind force and direction when he felt a knock on his head. Turning quickly to see who was there, he was surprised to see nobody — but a few feet above him was the hovering skua which had attempted a landing on his head.

Position of ship: 25° 57'S, 99° 32'E.

Equatorial Pacific

m.v. *Southland Star.* Captain A.J. Chivers. Auckland to Honolulu. Observers: the Master, Mr P.S. Sinclair, 3rd Officer and ship's company.

8 August 1988. At approximately 1900 GMT a bird was found on the after deck. Although no positive identification could be made, it was decided that the visitor was a Bo'sun Bird as it was very similar to the Bo'sun bird pictured in *The Marine Observer*, October 1987 (m.v. *Encounter Bay*).

The bird, which was sheltering under the port bulwark, seemed to be suffering from exhaustion and also had a light film of oil on its breast. When offered fish

and water, both were refused with surprising viciousness considering the bird's slightly dishevelled state. Later in the day, at about 2100, it was once again offered food and water (although slightly more tentatively this time), but again, both were refused. However, at this time, it was obvious that the bird was making a recovery as it was walking around and looking considerably more lively (or menacing, depending on point of view) and at 2130 it flew off to the south-west clearly fully recovered and none the worse for its stay on board.

Position of ship: 05° 20'N, 165° 12'W.

Note. Captain P. Chilman, of the Royal Naval Birdwatching Society, comments:

'This was definitely a Bo'sun Bird, in this case, a Red-tailed Tropicbird (*Phaethon rubricauda*), the red tail streamers are just visible in the photograph. [Unfortunately, the photograph lacked sufficient definition for good reproduction.] It breeds in the tropical Indian and Pacific Oceans and wanders widely; it may be met with many hundreds of miles from land and is quite often seen on the water, when it rides high. There are two other very similar species which are also found in the tropics.

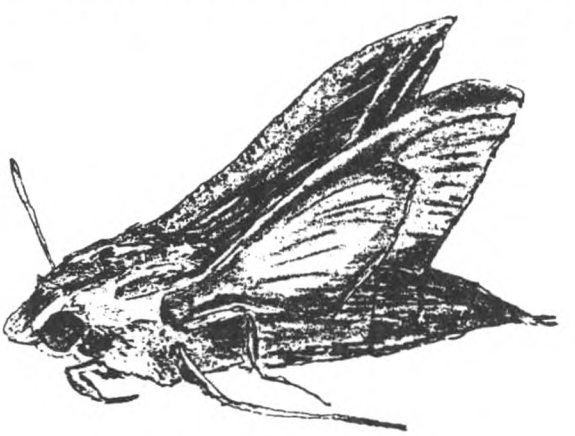
'The photograph shows what appears to be whole, tinned sardines, I have found that birds are much more likely to feed if offered small pieces of fish.' (See *The Marine Observer*, July 1986, pp. 137–139).

MOTH

Indian Ocean

s.s. *ACT 1*. Captain R. Brownbill. Suez to Fremantle. Observer: Mr K. Lumby, Chief Officer.

3 July 1988. At 0020 GMT the moth shown in the sketch was discovered on the bridge wing. It was approximately 5.5 cm in length and was brown in colour with dark-brown and white stripes down the upper side of its wings. In addition, it had



two white lines along the trailing edge of the wings. There was a light, khaki-coloured patch just behind the eye, whilst the underside of the head was almost white, and there was a line of almost white patches which ran down the centre of its back. At the time, the wind was NNE'ly, force 6.

Position of ship: 30° 17'S, 112° 57'E.

BIOLUMINESCENCE

Arabian Sea

m.v. *Fort Assiniboine*. Captain P.H. Hill. Penang to Karachi. Observers: Mr R.R. Jatar, 2nd Officer, Mr J.J. Alapat, 3rd Officer and Mr R. Aurora, Radio Officer.

14 September 1988. At 2130 GMT unusual bioluminescence was observed in the form of rotating, phosphorescent wheels (as termed in the *Marine Observers' Handbook*). Several wheels were seen, the largest (and the first) was approximately 500 m in diameter. They all had a luminescent, flashing 'hub', the one belonging to the largest wheel was approximately 200–300 m from the ship. The others were closer at about 100 m. All the wheels appeared to be rotating in an anti-clockwise direction, with a period of about 2 seconds between the passage of each consecutive 'spoke'. The colour of the luminescence was white.

It appeared highly unlikely that these effects could have been caused by the presence of the ship or its movement through the water primarily because of the distance from the ship to the first wheel's hub and because the spokes of the wheel extended to an arc of the sea, well forward of the ship's bow.

Besides these wheels, there were large, irregular patches of light observed all around the ship (in most cases, well away from the wake) flashing at regular intervals. The luminescence was extremely bright, and initially, to all the observers present, appeared as if caused by a powerful, rotating searchlight directed onto the surface of the sea from an aircraft. The activity continued for approximately 15 minutes.

Position of ship: 23° 27'N, 67° 23'E.

Gulf of Aden

m.v. *Encounter Bay*. Captain B.V. Chipperfield. Suez to Melbourne. Observers: Mr K. Riddick, 2nd Officer and Mr R. Henstock, SM1.

18 September 1988. At 2109 GMT on a clear, fine night with smooth seas, luminescence was noticed while the observers were looking over the side of the ship. A slight twinkling was seen where the few ship's lights that were on shone on the water; at first, it looked like the reflection of the moon or a low planet on the water.

The bridge torch was shone over the side and more lights were observed in the form of patches about 60 cm in diameter which glowed white for a second as the light hit them, followed by a gradual fade. The impression was that these were fairly deep and not on the surface.

The Lookout then pointed the Aldis lamp over the side and huge areas of the sea lit up brightly at distances of up to 100 m from the ship. The effect was such that it was possible to 'write' in great swathes across the water. If the light was moved over large areas, the effect produced was that of 'milky seas'. There was a slight delay in the appearance of the luminescence after the beam hit the water, possibly indicating depth.

The phenomenon lasted for about an hour and a half during which time the echo-sounder was turned on and off with no obvious effect.

Position of ship: 12° 18'N, 47° 28'E.

Note. Dr P.J. Herring, of the Institute of Oceanographic Sciences, comments:

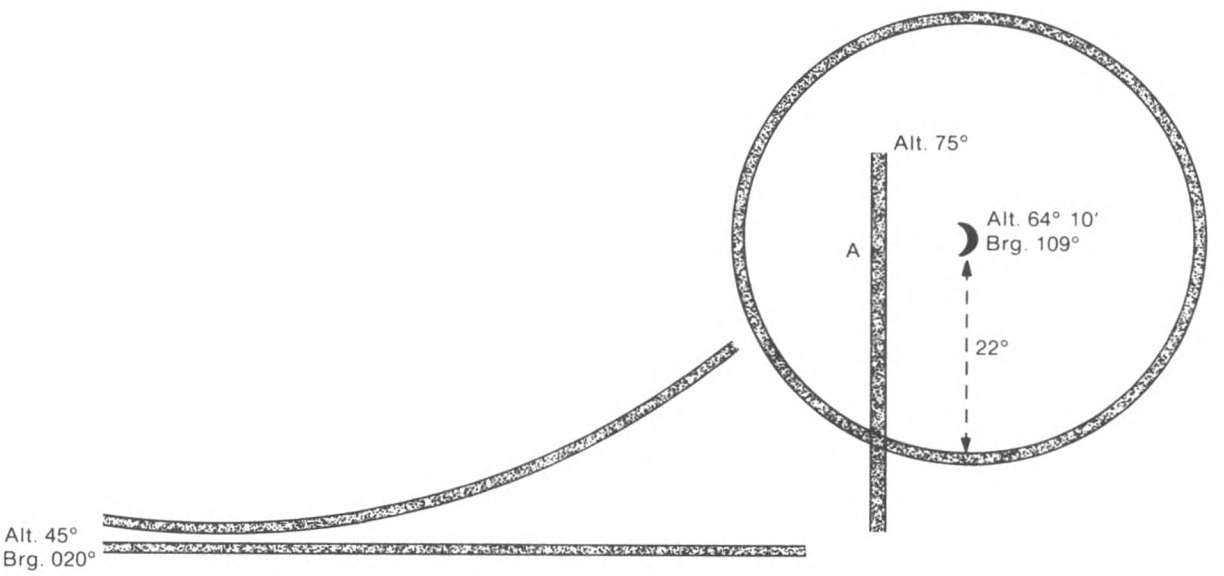
'This is a startling description of light-stimulated luminescence and is much more dramatic than most such displays. I am sure that small crustaceans called ostracods, were responsible. They form huge swarms near the surface, in the Indian Ocean in particular, and respond readily to a bright light source by squirting luminescence into the water from gland cells. The light then persists for quite long periods. Naturally it is used by the animals as a defence against predators and to signal each other in mating swarms.'

HALO COMPLEX

Indian Ocean

m.v. *Leonia*. Captain A.F. Devanney. Juaymah to Rotterdam. Observer: Mr N. Parkes, 3rd Officer.

27 August 1988. At 1905 GMT a lunar halo of 22° radius was observed when the altitude of the moon was 64° 10′, bearing 109°. At first, all that was visible was the halo, but at 1925 the tangential arcs began appearing an intensified over the following few minutes, see sketch.



The complex was brilliant white, with well-defined limits, occasionally being partly obscured by cumulus cloud invading from the south-west. Towards the end of the observation, arc 'A' moved rapidly away from the halo and appeared to pass over the observer's zenith. The halo and arcs gradually faded until, at 1955, they were no longer visible.

Weather conditions at 1800 were: air temperature 25.8 °C, wet bulb 24.5, pressure 1009.8 mb, wind SW'ly, force 4.

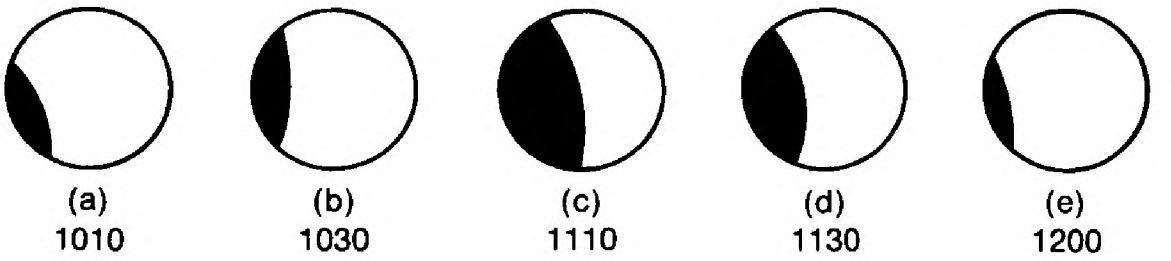
Position of ship: 00° 13′N, 50° 12′E.

HALO AND PARTIAL ECLIPSE

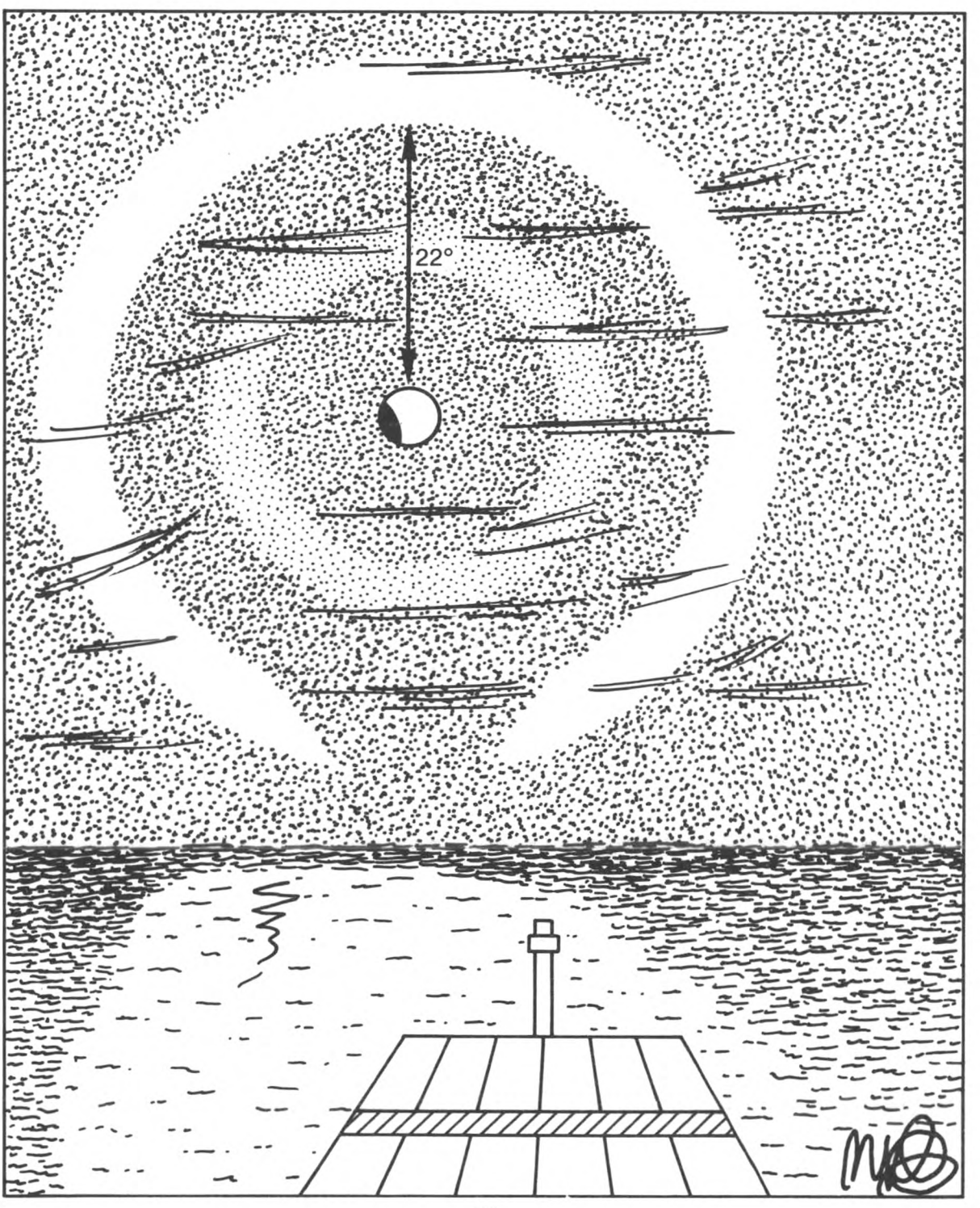
Indian Ocean

m.v. *Resolution Bay*. Commander D.V. Harradine, RD, RNR. Rotterdam to Melbourne. Observers: the Master, Mr I.M. Hill, 1st Officer, Mr M. Barraclough, 2nd Officer, Mr S.H. Pearce, 3rd Officer and Mr M.R. Greenslade, Cadet.

27 August 1988. At 1010 GMT a partial eclipse of the moon commenced. Sketches (a) to (e) illustrate the progress of the Earth's shadow over the moon's disk, sketch (c) shows its maximum extent.



(a) 1010 (b) 1030 (c) 1110 (d) 1130 (e) 1200



(f)

During and following the eclipse, a halo of radius 22° was noted around the moon, persisting until 1400. The effect of the joint phenomena is shown in sketch (f). Cloud cover was 8 oktas of cirrostratus accompanied by streaks of more dense cirrus. At 1157 the altitude of the moon was 23° 35′, bearing 084°.

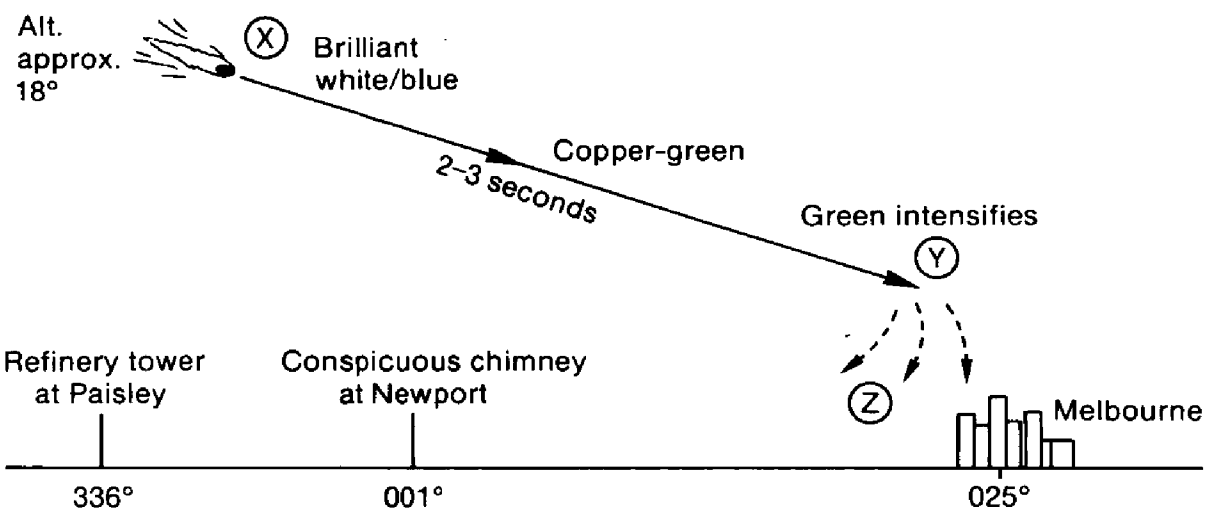
Position of ship at 1200 GMT: 36° 13′S, 114° 58′E.

FIREBALL

Indian Ocean

m.v. *ACT7*. Captain N.D.T. Johnson, RD*. Rotterdam to Melbourne. Observer: Mr M.J. Power, Chief Officer.

14 August 1988. At approximately 1836 GMT a fireball was first seen as shown in the sketch, when it entered the observer's line of sight.



It was initially thought to be air traffic into Melbourne, but this was immediately discounted because of the object's brilliance and its relative speed across the sky.

The core of the fireball was intensely brilliant, brighter than any shore lights and even more brilliant than Venus. It glowed brilliant white/blue as it travelled across the sky from point X on the sketch, turning copper-green as it decreased in altitude. The fireball left a definite trail across the sky, whether this was due to image retention by the retina or because it was an actual trail was not known. At point Y on the sketch, the fireball faded suddenly as three definite pieces broke away and fell at point Z; the duration of flight from X to Y was 2–3 seconds. The fragments glowed red for an instant before disappearing.

This was a spectacular sighting which coincided with the observer securing loose halyards on the bridge monkey island and so not being in a position to attempt a more accurate observation.

Position of ship: approximately 38° 00′S, 145° 00′E.

Note. Mr H. Miles, Director of the Artificial Satellite Section, British Astronomical Association, comments:

'This is a very good and detailed report of a brilliant fireball from both a positional and descriptive point of view. It is doubtful whether any fragments reached the ground; nevertheless, the report is being forwarded to astronomical organisations in the area so that the information can be added to any other data which they may have collected.'

AURORA BOREALIS

North Sea

f.p.v. *Sulisker*. Captain D.K. Dickson. On patrol within Scottish Fishery Limits. Observers: Mr A.S.T. Beveridge, 2nd Officer, Mr J.C. Barton, 2nd Officer and Messrs G. Anderson and J. Russell, Seamen.

11/12 September 1988. At 2034 GMT on the 11th the first indications of an auroral display were noticed. Rays and patches extending from west-north-west to north-north-east, through north, were recorded at elevations between 10° and 30°. Their brightness was weak. The following observations were made as the display progressed. All times are GMT.

11th 2047: Homogeneous arc with rays at eastward edge; constant activity at eastward edge, decreasing towards west. Arc strongly defined. Brightness weak to moderate.

2050: Rayed band at eastward edge. Brightness weak to moderate. Arc still well defined, with patches forming below.

2100: Intense activity at either end, altitude increasing, brightness increasing; suddenly fades from west.

2102: Main activity now in eastward section. Arc from north to east, altitude 5° to 90°. Very active rayed bands pulsating, brightness moderate, slight yellow/green colouration. Some glow and patches to west. Brightness decreasing with altitude.

2106: Rayed band in east suddenly disappears. General glow over whole of northern sky, strongest in north. Occasional single rays. Brightness weak.

2115: Rayed band reduced to glow and occasional patches. Brightness weak. Glow extending to about 90° altitude.

2149: Homogeneous arc in west. Brightness moderate, fading quite quickly. Other patches extending to east and at about 90° altitude.

2152: Arc gone; now a large U-shaped area of glow to the west, brightness weak. Slight indication of rays in glow.

2155: Narrow, well-defined band extending from eastern horizon to directly overhead, i.e., 90° arc. Brightness moderate. Slight patches and glow to north and west, brightness weak.

2158: Several narrow beams extending from a point just above the eastern horizon, spreading slightly as they pass overhead and diminishing towards the west. Brightness weak to moderate. Pulsation increasing.

2213: Strong pulses extending from east to west passing directly overhead, brightness moderate, pulsing very quickly like huge searchlights flashing on/off, narrowing towards the horizon.

2245: Display faded to patches with slight rays in east. Brightness weak.

2310: Rayed arcs and bands, green in colour, from 20° to 90° above the horizon. Some cloud in evidence at this time.

2232: Patch extending from 10° to 25° above horizon to west.

2353: Homogeneous, U-shaped band; bottom of 'U' to south of west, stretching northwards and from 10° to 30° above the horizon.

12th 0023: Rayed arc and band. Brightness moderate. Cloud obscuring some parts.
0050: Partial coronal ray display. Centre about 15° above horizon to north-west of vessel. Some pulsating display at about 40° altitude in an easterly direction, with a general glow through the northern sky.

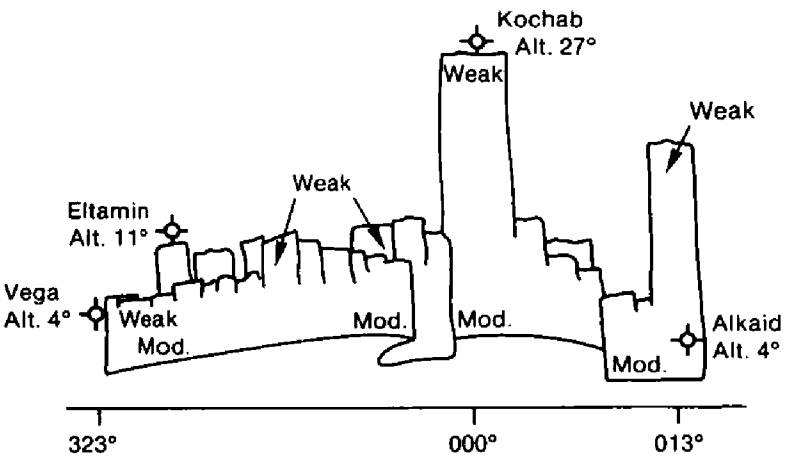
At 0100 observations of the aurora ended owing to large amounts of cloud obscuring the northern sky.

Position of ship at 0000 GMT on the 12th: 61° 24′N, 00° 42′W.

Gulf of Maine

m.v. *London Spirit*. Captain R.B. Tarbuck. Boston to Skikda. Observers: Mr W. Howarth, 3rd Officer and Mr J.M. Clark, 3rd Officer.

16/17 September 1988. At the change of watch on this night there was a faint glow in the northern sky; by 0600 GMT it had developed into the rayed band form of aurora. The sketch, made at 0750, shows the greatest extent of the display which had ceased by 0900.



The display was quiet, and of weak to moderate brightness; the rayed band was the only form seen. It was difficult to describe the colour of the display; at its most intense phase, the light was very pale green or perhaps a weak *eau-de-Nil*.

Weather conditions at 0750 were: air temperature 13.4 °C, wet bulb 10.2, pressure 1029.0 mb, wind N'ly, force 1–2, cloud cover was 1 okta small cumulus.

Position of ship: 42° 13′N, 66° 31′W.

629.12:910.4(99)

R.R.S. *Discovery* and the Discovery Investigations*

By Anthony L. Rice
(Institute of Oceanographic Sciences)

On the high spring tide of March 27, 1986 the Royal Research Ship *Discovery* was eased gently out of Saint Katharine's Dock, near London's Tower Bridge, and loaded bodily onto a huge transport vessel to be carried back to her birthplace in Dundee. There this historic vessel will be restored to her condition in the 1920s, toward the end of her active seagoing career, and will form the centerpiece of a major maritime exhibition.

During the previous 55 years, the *Discovery* had been laid up in London, initially in the East India Docks, but from 1937 to 1979 on the Victoria Embankment where she became one of London's most familiar landmarks. She is perhaps best known as Captain Robert Falcon Scott's first Antarctic ship, but her claim to fame, and her depiction on several stamps, is based on much more than this.

Discovery was built in 1901 by the Dundee Shipbuilding Company specifically for Scott's national Antarctic Expedition. She was barque-rigged, with an overall length of 198 feet, 1,620 tons displacement, and was fitted with two 450 horsepower triple-expansion steam engines and a lifting propeller and rudder.

Frozen in place

The purpose of the expedition was to make scientific observations on and around the Antarctic continent, but with no specific intention to reach the South Pole, unlike Scott's second expedition in 1910 to 1913. *Discovery* sailed from Cowes on August 6, 1901 and, after refitting in New Zealand, left Lyttleton for the Antarctic on December 21. After sailing down the coast of Victoria Land to McMurdo Sound, she turned eastward along the length of the Ross Ice Barrier and discovered King Edward VII Land (Edward VII Peninsula) at its eastern end. *Discovery* then returned to McMurdo Sound and winter quarters were established at Hunt Point on Ross Island where she eventually became frozen in. She could not be freed the following February (1903) when the relief vessel *Morning* visited the base, but was eventually released a year later. On February 16, 1904, she left the Antarctic with the *Morning* and another Dundee whaler, the *Terra Nova.*

All three ships are commemorated on a set of stamps issued by the Australian Antarctic Territories in 1979 (Figure 1(a)). The *Terra Nova* is remembered mainly for her role on Scott's fateful British National Antarctic Expedition, from 1910 to 1913, which ended in the tragic death of the leader and his four companions. This early period in *Discovery's* career is also commemorated on a British Antarctic Territories stamp, issued in 1980 as part of a set to mark the one hundred and fiftieth anniversary of the Royal Geographical Society. The 7p stamp shows Sir Clement Markham, President of the Society from 1893 to 1904

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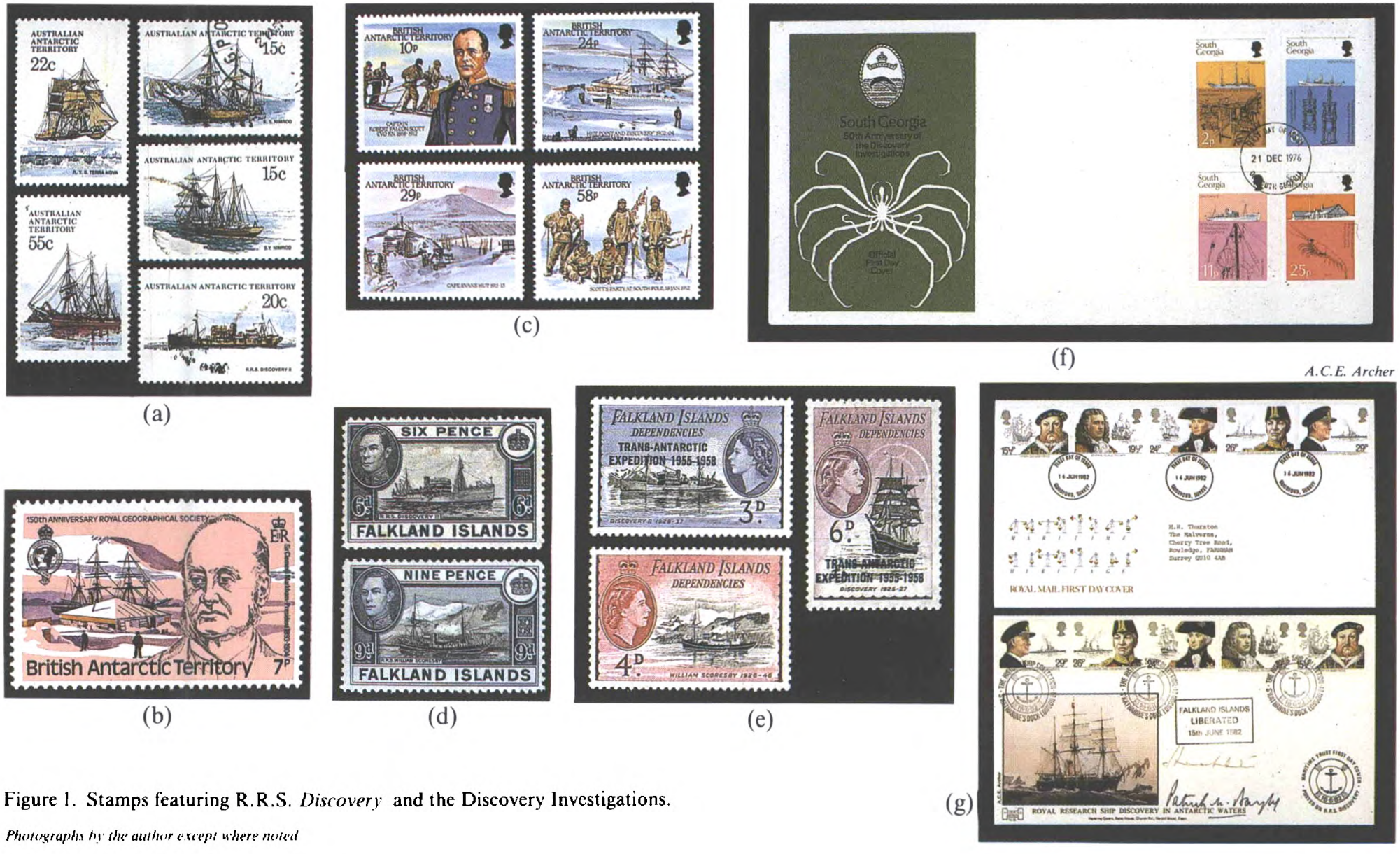

Figure 1. Stamps featuring R.R.S. *Discovery* and the Discovery Investigations.

Photographs by the author except where noted

Opposite page 128

Opposite page 129

Photo. by J. Barkess

Billow clouds as seen from f.p.v. *Norna*. (See page 113.)

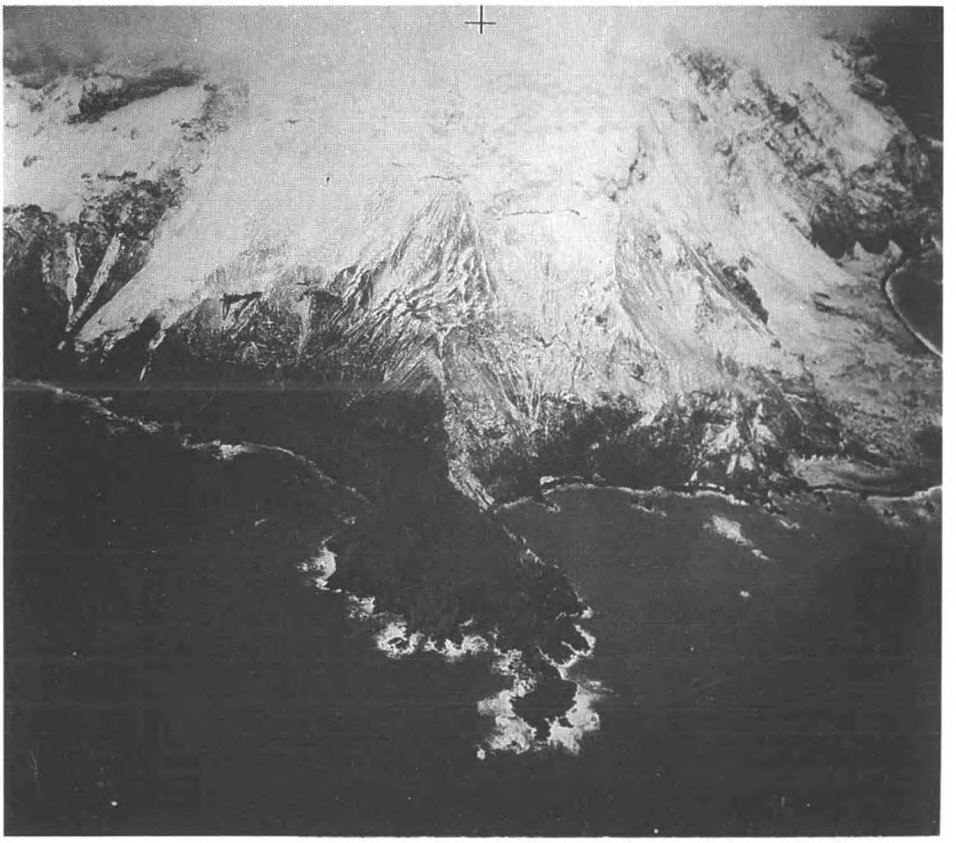

Photo. courtesy of S.A. Englebrecht, South African Weather Bureau

An aerial oblique view of Cape Circumcision on Bouvetøya's northwest coast, looking towards the southeast. Westwind beach is to the right of the Cape. This shot was taken from an RSA helicopter during the 1966 South African Survey Expedition. (See page 131.)

and the main instigator of Scott's first expedition, against a background of *Discovery* at her winter quarters at Hut Point (Figure 1(b)). The same view was used for one of a series of stamps issued by the British Antarctic Territories in 1987 to mark the seventy-fifth anniversary of the arrival of Scott's party at the South Pole, though a more appropriate subject would have been the *Terra Nova* (Figure 1(c)).

Following her return from the Antarctic, the *Discovery* was purchased in 1905 by the Hudson Bay Company and was employed in supplying the company's posts and collecting their produce. After being laid up in 1911, she was chartered by the French Government in the early part of the World War I and was used to transport war materials. After the war, she made a final voyage for the Hudson Bay Company in 1918–1919 and the following year was chartered for a trading voyage to the Black Sea.

Refitted for new duties

In 1923, the *Discovery* was purchased for what later became the Discovery Investigations, established to study all aspects of the Southern Ocean having a bearing on the Antarctic whaling industry. She was extensively refitted at Vospers in Portsmouth, being given new masts, spars, sails, and rigging, and was modified from her original design to improve her sailing qualities.

With the title of Royal Research Ship, the *Discovery* left England in September 1925 and spent two southern summers working between Cape Town, South Georgia, the South Orkneys, and the Falklands, and was joined for the second summer cruise by the newly built *William Scoresby*. During the two cruises, the *Discovery* worked 299 standard stations, where a variety of oceanographic observations and biological collections were made, before she returned to England in September 1927. The voyage had been a considerable success, but it had become clear that the *Discovery* was not well suited for the tasks she was expected to carry out. She was uncomfortable to work on, her engines were old, her fuel capacity was too small, and her standing rigging made deploying gear over the side difficult. Consequently, the *Discovery* Committee decided to replace her with a modern steel ship, *Discovery II*, which eventually sailed on her first commission in 1929.

In the meantime, the old *Discovery* made a final visit to the Antarctic when she was used for the British, Australian, and New Zealand Antarctic Research Expedition from 1929 to 1931 under the leadership of Sir Douglas Mawson. Similar observations to those of the Discovery Investigations were made at 115 stations during the two southern summers, but this time in the Antarctic Ocean between South Africa and Australia.

A chain of owners

On her return to London, the ship was laid up in the East India Docks until 1937 when she was handed over to the Boy Scouts Association to be used as a training ship for Sea Scouts. In this role, the *Discovery* moved to the Victoria Embankment where she remained for 40 years, being used by the Royal Navy for new entry courses during World War II and transferred to naval responsibility in 1955. Finally, in 1979, she was transferred to her present owners, the Maritime Trust.

Following the departure of the *Discovery* from the Discovery Investigations, the program continued with the *William Scoresby* and the *Discovery II*, these

vessels having respectively undertaken seven and five Southern Ocean commissions by the beginning of World War II. During this period, both ships were depicted on attractive Falkland Island stamps issued in 1938 (Figure 1(d)). The ships were taken into military service during the war and in 1948 were purchased by the Admiralty from the Falklands government and presented to the National Institute of Oceanography on its establishment in 1949.

The new institute was to take over the Discovery Investigations and each of the ships made a further Antarctic cruise after the war. For the *William Scoresby* this was to be her last cruise, for when she returned to the United Kingdom in December 1950, she was laid up in Plymouth in the hope that she could be recommissioned at a later date. The financial situation was such that this was impossible, and she was sold for scrap in 1953. The *Discovery II* continued in use throughout the 1950's, but during this period her cruises tended to be much shorter than her earlier commissions and were concentrated in the North Atlantic. She was finally broken up at Cobb in Ireland in 1963, to be replaced by another new vessel, again named *Discovery*, which is still in use today.

All three of the Discovery Investigations vessels were featured on a set of stamps issued for the Falkland Islands dependencies in 1954 and reissued in 1956 overprinted for the TransAntarctic Expedition of 1955–1958 (Figure 1(e)). The dependencies at this time consisted of South Georgia, the South Sandwich Islands, the South Shetland Islands, the South Orkney Islands, and the Graham Land peninsula. In 1963 the South Shetland Islands, South Orkney Islands, and Graham Land became a separate colony, the British Antarctic Territories, and began to issue their own stamps. South Georgia and the South Sandwich Islands remained dependencies of the Falklands, but from July 17, 1963 until May 4, 1980 their stamps were inscribed "South Georgia". Among the 13 stamp issues made during this period, an attractive set of 4 stamps was issued on December 21, 1976 to mark the fiftieth anniversary of the Discovery Investigations and the first cruise of the R.R.S. *Discovery*Figure 1(f)).

In addition to their depiction on stamps, the Discovery Investigations vessels have also appeared on first-day covers. Thus, the *Discovery*, *William Scoresby* and *Discovery II* were each featured on the covers for a set of stamps illustrating the marine life of the Southern Ocean issued by the British Antarctic Territories in 1984. Finally, the *Discovery's* connection with the Falkland Islands was also recalled on June 16, 1982 when a British Maritime Heritage set of stamps was issued to mark Maritime England Year, the Bicentenary of the Livery Grant by the City of London to the Worshipful Company of Shipwrights and the raising of the *Mary Rose* from Portsmouth harbor. In addition to the official Royal Mail first day cover, a special cover carrying a reproduction of a painting of the ship by A.C.E. Archer was designed for the Maritime Trust to be issued on the *Discovery* herself. Both the stamp issue and the covers were planned many months earlier. In the meantime, the Falklands conflict had intervened, and the islands had been retaken by British forces the day before the issue, resulting in a last minute overstamp to this effect on the Maritime Trust covers (Figure 1(g)).

Anthony L. Rice specializes in deep sea benthic biology in his position at the Institute of Oceanographic Sciences Deacon Laboratory at Wormley in the United Kingdom. After completing his Ph.D. degree on plankton behaviour at the University of Liverpool, he spent two years at the University of Miami (Florida) as a Harkness Fellow.

From 1966 to 1973, Rice was Curator of Crustacea at the British Museum

(Natural History) in London. There, in 1973, he organized the museum's exhibition to mark the centenary of the *Challenger* Expedition. This led to an interest in the history of oceanography and the publication of several historical articles and a book, *British Oceanographic Vessels 1800–1950*. Rice continues his series on oceanography on stamps writing about the *Discovery*.

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Bouvetøya — an Island Enigma*

By Michael J. Mooney

(Flushing, N.Y.)

Look at a map of the South Atlantic Ocean and run your finger down the Greenwich Meridian to 54° 26′ South. Now go east to 3° 24′ where a bleak, snow-clad outcropping of black volcanic rock stands poised atop the southern terminus of the 10,000 mile Mid-Atlantic Ridge. (Figure 1).

This is Bouvetøya (BOO-vah-toy-ah) or Bouvet Island — the most forlorn and desolate speck of land to be found in all the world.

Surrounding Bouvetøya for more than a thousand miles on every side is the great Southern Ocean where millions of square miles of tortured, storm-wracked "sea-wastes" are home to the world's most consistently fierce weather. Here the winds howl eternally and unobstructed ever round the high southern latitudes of the world. In this realm of the perennial ill wind, monstrous seas, frequent hurricane-like blizzards, blinding sea-fogs, great treacherous icebergs, and scudding, low-lying clouds are the rule where summer temperatures rarely exceed 2 °C (36 °F). During the unimaginable Austral winter, vast fields of grinding pack and drift ice have forestalled any sane attempts at human penetration.

This is "home" for Bouvetøya, which also has the singular and dubious distinction of being the most isolated point of land on the face of the earth. No other place is further from its nearest neighbour than Bouvetøya. Bouvetøya's nearest "neighbour" is Antarctica's Queen Maud Land, "just" 1100 miles due south. Celebrated Tristan da Cunha — the world's most isolated inhabited locale, lies a mere 1400 miles to the northwest.

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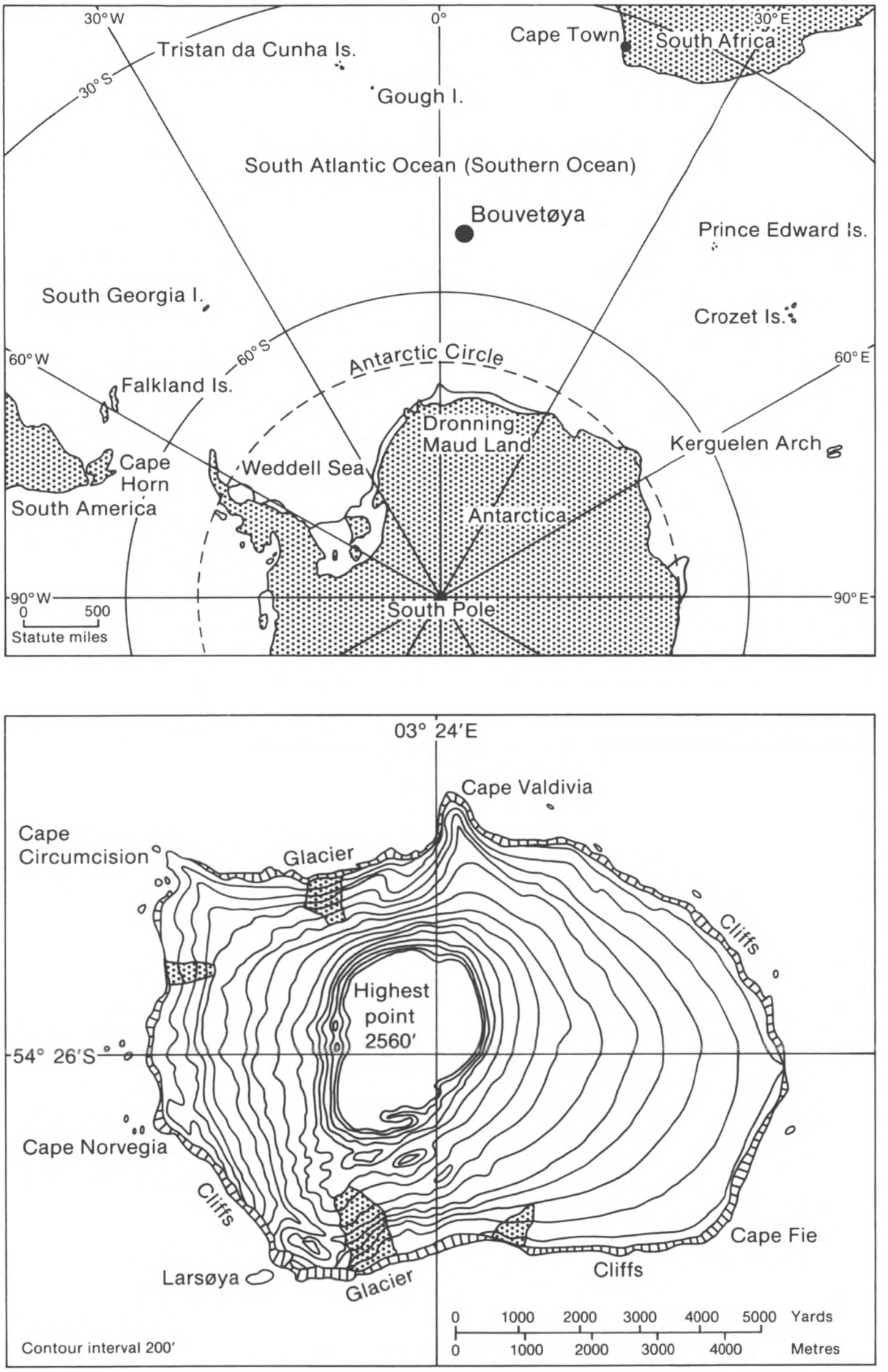


Figure 1. Bouvetøya's lonely position in the South Atlantic.

Bouvetøya itself is a ragged ellipse measuring four by five miles, and Sailing Directions describe the island as "composed mostly of black lava with a volcanic cone and a wide crater. The slopes of this cone terminate either in glaciers or steep cliffs. The western and northern sides of the island are comparatively free of ice and are much steeper than the eastern portion which is entirely covered with an ice sheet extending up the crater slopes".

For all its obvious shortcomings, Bouvetøya has received far more than its fair share of attention over the last 237 years. In 1738, France took the lead in searching for a great and lush southern continent, said to lie far south of Africa's Cape of Good Hope.

In the summer of 1738 Captain Jean Baptiste Charles de Lozier Bouvet left Lorient with two small ships to search for this fabled "land of princes and parrots" that could also serve the French East India company as a sorely needed southern replenishing station.

After months of southerly navigation the tiny French squadron entered the fearful "Roaring 40's" and, by year's end, found itself careening uncertainly before continuous gale winds near 54° South.

On January 1, 1739, Bouvet chanced to glimpse, through a chance break in the heavy sea-fog, what he described as "a grim, glaciated double peak looming out of the sea". To those on deck it emerged "as a headland of an extensive land area," due, possibly, to an extension of the fog-bank behind the island.

Undaunted, Bouvet jubilantly logged the discovery of the northern tip of the great, long-sought Southern Continent–Terra Australis Incognita! To honor this auspicious date, Bouvet named the forbidding promontory, "Cap de la Circoncision" or Cape Circumcision after the corresponding feast-day in the Church calendar. How bitterly ironic that Bouvet had discovered — not his fabled lost continent — but the tip of the most forlorn and isolated island on the face of the earth.

Though Bouvet's epic voyage failed to discover the "promised lands" he sought, it did give France undying credit for having opened the portals leading to the discovery of Antarctica itself, while commencing nearly 250 years of scientific study and exploration that continues to this day.

It was Bouvet who first saw the gigantic tabular icebergs found only in high southern latitudes. It was Bouvet who discovered the greatest whaling waters ever found on earth. And it was Bouvet who discovered that lovable symbol of the "high South" — the penguin!

It was also Bouvet who unwittingly set in motion a classic geographic mystery game of hide-go-seek, destined to thwart such great explorer-navigators as James Cook and James Clark Ross — an enigma that remained unsolved until the eve of the 20th Century.

Other nations, aroused by Bouvet's startling discoveries, strove to extend their influence into these vast, virgin and uncharted regions where sea, sky and ice reigned supreme — with an occasional spot of land now and then as an added lure.

In 1772, England's Captain James Cook embarked in *Resolution* on his second globe-girdling voyage of austral scientific exploration and discovery. Following Bouvet's original directions, Cook searched extensively for the tiny island, but to no avail. It had disappeared!

Unaccustomed to such setbacks, Cook ultimately dismissed the very existence of Bouvet's island, calling it instead a giant iceberg understandably thought to be an outcropping of snow-capped land.

In 1808, James Lindsay, an English whaling skipper, did discover an island in the same general area which he named, logically, Lindsay Island. Contemporary geographers, however, discounted the sighting, preferring to side with the more illustrious Captain Cook.

Seventeen years later, George Norris, another English whaler, also sighted an island near 54° South, which he described as "a towering glaciated volcanic twin-peak", and named Liverpool Island after Lord Liverpool. Assuming he had discovered a hitherto unknown island, Norris sent in the first successful landing party and claimed the island for England in the name of George IV.

Now confusion reigned! Did Bouvet's island exist after all? And what of these other mysterious outcroppings of land?

In 1839, Sir James Clark Ross commenced an epic four-year expedition to the south polar regions, exactly 100 years after Bouvet's original sighting. Finally, Ross admitted failure in tracking down and pinpointing what he wistfully called "that child of the mist, Bouvet Island". Once again, Bouvet's discovery had taken leave of the world.

Forty-five years later it befell the Germans and their methodical persistence to settle once and for all the reality of this on-again, off-again insular legend. In 1898 a deep-sea expedition aboard the Hamburg-Amerika liner *Valdivia* conducted an exhaustive, quartering search of vast reaches of the Southern Ocean surrounding the original plot.

After months of nerve-wracking reconnoitering, Bouvet's elusive island was at last sighted — never to be lost again — but far from its original recorded position. Through a seemingly "simple" error in navigation, France's intrepid pathfinder unknowingly stymied several of history's most illustrious sea-explorers for more than a century, while a few lesser-known mariners stumbled upon the island, more by chance than design — only to be scoffed at for their efforts.

The official position of "that child of the mist" was finally given as 54° 26.4′ South by 3° 24.0′ East — fully 200 miles west of the originally plotted position! A careful survey of adjacent seas concluded that Bouvet's, Lindsay's, and Liverpool islands were — and always had been — one and the same place, and this was named after Monsieur Bouvet.

In 1927 Lars Christensen Sandefjord of Norway sponsored an ambitious scientific/commercial expedition to the island and claimed the near-legendary outpost for Norway. Another reason was Norway's ambition to control nearby lucrative whaling waters.

Britain immediately challenged Norway's annexation, citing her claim 102 years earlier, but Norway remained adamant and threatened to bring the matter before the League of Nations. In the light of possibly adverse world opinion, Britain gracefully relinquished her claim the following year and Bouvet Island became Bouvetøya, a Norwegian dependency by law.

After the Second World War, and with the advent of the nuclear age, global meteorology became a strategic issue. Bouvetøya's importance amidst millions of square miles of "empty" ocean became glaringly obvious.

South Africa, lying "downwind" from Bouvetøya, saw this and dispatched a meteorological expedition to Bouvetøya in 1955. The venture was thwarted, however, due to adverse weather and ice conditions.

Eleven years later, South Africa had another go at Bouvetøya. By then Pretoria had developed a vast semi-circle of outlying insular reporting stations at Tristan da Cunha, Gough, and Marion. Square in the middle lay a huge gap of

unreported ocean spanning 104° of compass bearing — where lay — Bouvetøya. This time the expedition succeeded and a variety of multi-disciplinary scientific goals was achieved. (See photograph opposite page 129).

In recent years, Bouvetøya has stood alone in her isolated part of the Great Southern Ocean and continued to draw the attention of scientific expeditions, especially from Norway. Her strategic meteorological importance has lessened with the development of weather satellites and computerized meteorology, but no other piece of land has ever played a more significant role for its size in recorded history then Bouvetøya — "that Child of the Mist."

AURORA NOTES JULY TO SEPTEMBER 1988

By R.J. Livesey

(Director of the Aurora Section of the British Astronomical Association)

As usual, in Table 1 are given the marine auroral observations received to date for the period. In Table 2 are noted important auroral observations received from a variety of observers stationed around the world. There is a change of format in Table 2 for a variety of reasons. Summer twilight affects observing in

Table 1 — Marine Aurora Observations July to September 1988

Date	Ship	Geographic Position	Time (GMT)	Forms in Sequence
9/10 Aug. ..	*Norna*	58° 30′N, 06° 37′W	0039–0145	qRB, RR, RB, G
14/15 ..	*Irene Greenwood*	41° 46′S, 138° 11′E	1030–1050	HA+G, HA
21/22 ..	*Canmar Europe*	49° 23′N, 65° 23′W	0200–0300	qHA, aRA
30/31 ..	*Norna*	59° 10′N, 08° 25′W	2330–0040	qRA, HB, HA
10/11 Sept. ..	*Vigilant*	56° 47′N, 10° 40′W	2120–2125	G, RB, G
10/11 ..	*Cumulus*	57° 00′N, 20° 00′W	2220–0150	qR_2B, qHB, qN, apR_3B, qN, aRB, qN
11/12 ..	*Sulisker*	61° 03′N, 00° 35′W	2034–0100	RR, mP, HA+RR, RB, pRB, GmP, HA, G, HB, RR, pRR, RA, RA, pHB, RA, CRR
11/12 ..	*Sea Searcher*	62° 12′N, 00° 10′W	2050–2140	G, m_4RB, amRB
16/17 ..	*London Spirit*	42° 13′N, 66° 31′W	0600–0900	G, RB
18/19 ..	*Cumulus*	57° 00′N, 20° 00′W	2230–0300	a_1, RA, a_2mHB, a_4fHP, qfHP
18/19 ..	*Matco Avon*	56° 48′N, 00° 42′W	0001–0300	aRB
21/22 ..	*Cumulus*	57° 00′N, 19° 47′W	0225–0235	qN
30 Sept./ 01 Oct. ..	*Europa Point*	72° 25′N, 10° 00′E	2115	mHB, RB, aRB

KEY: a = active, a_1 = folding of bands, a_2 = rapid change of lower form, a_4 = fading quickly, replaced by others, f = fragmentary, m = multiple, m_4 = 4 forms, p = pulsating, q = quiet, A = arc, B = band, C = corona, G = glow, HA = homogeneous arc, HB = homogeneous band, N = unspecified form, P = Patch, R_2 = medium rays, R_3 = long rays, RA = rayed arc, RB = Rayed band, RR = rayed structure.

north-west Europe, while the darker skies into which the aurora reaches down at lower geographic latitudes in America allows the occasional Canadian and American observer to detect and report active conditions lost to Europeans.

It is now well established, by analysing years of ground-based auroral observations and comparing visibility frequencies with geomagnetic latitudes corrected for the distortion of the magnetic field, that plotting auroral visibilities in terms of the geomagnetic latitude, as in Table 2 to date, is somewhat meaningless. Compare, for example, latitude data for Glen Ullin (North Dakota) and Fair Isle:

	Glen Ullin	Fair Isle
Geographic latitude	47.8°N	59.5°N
Geomagnetic latitude	53.0	62.0
Geomagnetic latitude (corrected)	57.5	57.5

By comparison, London is at geographic latitude 51.5 degrees north, which is poleward of Glen Ullin, it is at geomagnetic latitude 54 degrees north and at corrected geomagnetic latitude 47.5 degrees north. This explains why an amateur auroral observer, Mr Jay Brausch, in North Dakota, is logging more aurorae per annum than any observer on mainland U.K., and why logging aurorae by the uncorrected geomagnetic latitude is becoming meaningless.

Table 2 — Principal auroral activity reported July to September 1988

Date	Location	No.of Observers	Comments
7/8 Jul.	Winnipeg	1	Active arcs overhead
11/12	Winnipeg, Invercargill (N.Z.)	2	Glows
14/15	Winnipeg	1	Active storm overhead
20/21	North Dakota	1	Coronal rays
21/22	North Dakota, New Zealand	6	Coronal and zenithal rays
9/10 Aug.	Scotland	5	Glows, arcs and rayed bands
14/15	New Zealand	5	Glows and rays
21/22	North Atlantic, Scotland	2	Quiet rays and rayed arcs
30/31	New Zealand	3	Glows
10/11 Sept.	North Dakota, Scotland, Finland	8	Active storm
11/12	Scotland, Norway, New Zealand	5	Active storm, high latitudes
12/13	Iceland, Scotland, Norway	3	Active storm, high latitudes
17/18	North Dakota, Scotland	4	Rayed bands, generally quiet
18/19	Iceland, Scotland, Finland	9	Active storm

Another point of interest arises with the logging of auroral activity in terms of Greenwich Mean Time. The International Date Line, naturally, can produce complications. To the local observer, the aurora behaves to a pattern governed by local time, or more strictly, local magnetic midnight. The usual question to ponder over when looking at raw data, is to decide if the Canadians saw the aurora first, or the New Zealanders as the Earth rotated under the auroral oval, or was it the other way about? This is a good reason to ensure that observers all use Greenwich Mean Time, and are meticulous about dates when logging auroral activity. To avoid confusion, references to times have been omitted from Table 2.

I would like to acknowledge the work done by Dr M. Hapgood, of the Rutherford Appleton Laboratory, in analysing the geomagnetic latitude problem and calculating many corrected latitudes for us in the auroral locational analysis. The results are shown in Figure 1.

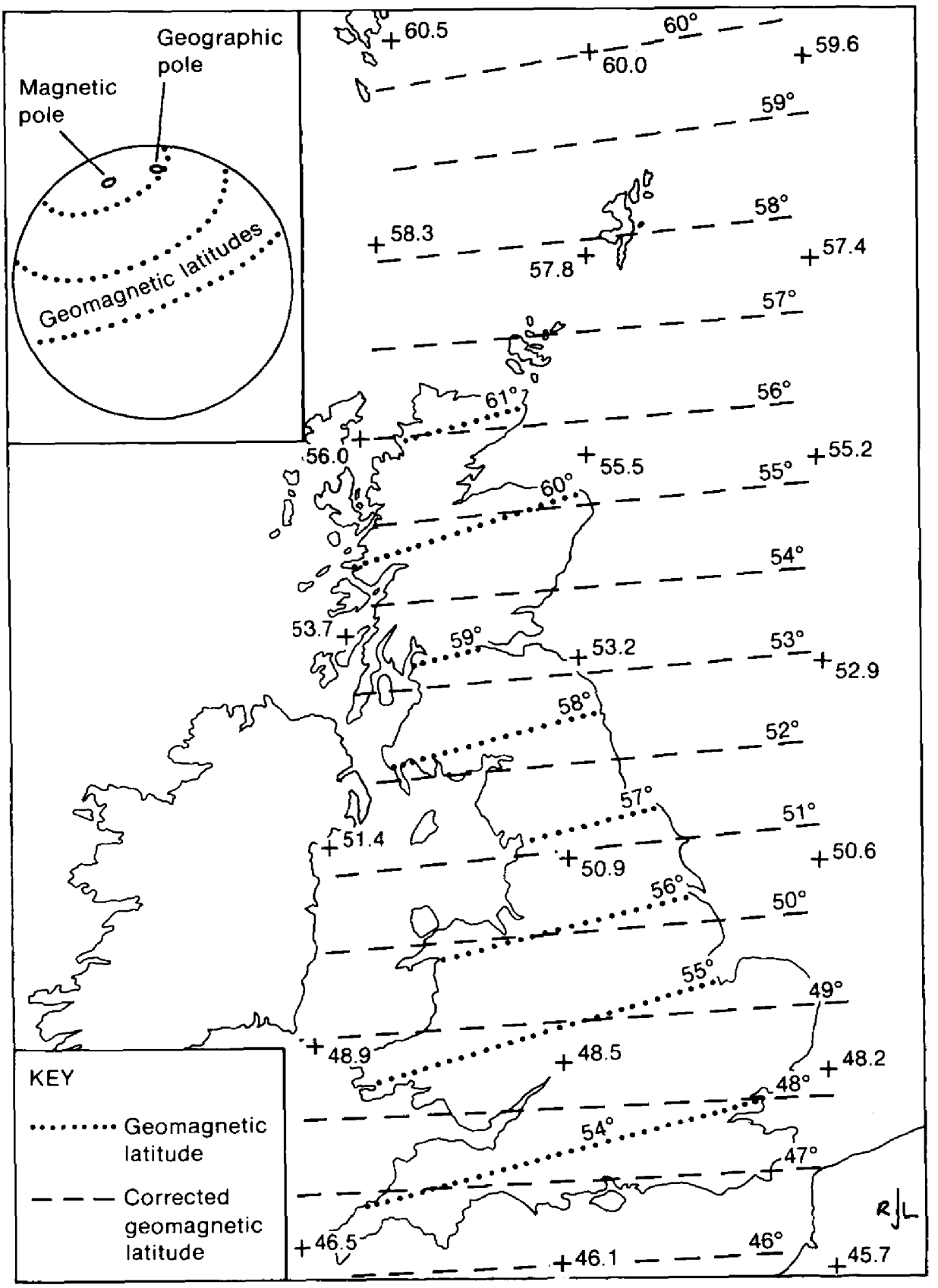


Figure 1. Contours of corrected geomagnetic latitude–1988, from co-ordinates computed by Dr M. Hapgood.

The sunspot activity is continuing to rise, but magnetic and hence auroral activity is still tending to lag behind. The marine observations for the period were of the usual high standard. The Fishery Protection Vessels *Norna* and *Sulisker*, together with O.W.S. *Cumulus*, all sent in detailed reports. One report not received via Bracknell but direct to hand came from Miss A. McDowell, a scientific officer on board the oceanographic ship *Sea Searcher*, who reported on the active, multiple rayed curtains seen on the night of 11/12 September when steaming between Shetland and the Faeroe Islands. An interesting drawing of rayed curtains observed south of Nova Scotia was made by the *London Spirit* on 16/17 September in the early morning.

As noted in Table 2, the principal active nights were those of 11/12 September and 18/19 September. In the first case, the activity began on the 10th/11th, but the peak of magnetic activity did not take place until the 11th/12th. In the second case, the magnetic and auroral activity began on the 17th/18th and continued into the 18th/19th. The earlier event is thought to have been generated by coronal particle streams coming from the sun, while the second involved the impact of a high-speed cloud of particles from the sun suddenly bumping into the Earth's magnetic field.

On 11/12 August, while observing an auroral glow, Kirkwall Airport Met. Office reported meteors travelling north to south, with trails 10–15 degrees long. This was the Perseid meteor shower which occurs annually in August, with peak activity on, or about the 12th on the month, although individual meteors of this stream can be seen between 25 July and 18 August. Looking back through the year, O.W.S. *Cumulus* reported the presence of meteors while observing auroral light on 18/19 January. This date was between known meteor showers. There is always a background of meteoric activity, and in dark conditions, an observer continuously looking at the night sky might be expected, on average, to see about six per hour in the first half of the year, and perhaps ten per hour in the latter half. These sporadic meteors may be seen randomly, and if several appear within a short interval of time, this may well be the result of chance.

It goes without saying that mariners should keep a good lookout. For my sins, I can confess that on two occasions I have undertaken a meteor observing watch facing south, totally oblivious to the fact that an aurora was active low down on the horizon behind my back. As the sunspots become more active, there should be plenty of auroral activity to see in the near future.

From *The Marine Observer* 40 years ago

THE EFFECT OF LIGHTNING ON SHIPS

Captain A.W. Ford, Master of the Ocean Weather Ship *Weather Recorder*, reported that whilst on her station in position 60° N., 20° W., at 0214 G.M.T., 28th December, 1948, the vessel was struck by lightning.

Weather: Wind SE Force 9, Barometer 974.9 mb. at 0000 falling to 958.1 mb. at 0300. Moderate rain with thunder and lightning until 0200, then heavy intermittent rain. At 0230 the wind veered to SW. At 0214 the ship was struck by lightning, a shower of sparks radiated from the vicinity of the windlass, and an explosion occurred similar to the sudden "blowing off" of a boiler. The ship was

illuminated by a blinding flash above and below decks. No structural damage was evident, but the V.H.F. Direction Finder aerial was burnt by the electrical discharge and on testing it was found that the Radiogoniometer had been damaged.

A chronometer watch which up to this time had had a steady daily rate of minus 16 to 17 seconds, rapidly gained 44 seconds, and then developed a variable rate of from 52 to 132 seconds gaining, due no doubt to the steel constituents of the watch becoming magnetised. It was later found necessary to replace this instrument.

The ship's chronometer had its rate altered from minus one second to plus three seconds and over the next few weeks settled down with a steady rate of two seconds gaining.

The accompanying table shows the effect the lightning had on the vessel's magnetic compass which was adjusted one week after the vessel was struck and

Record of changes in the deviation after being struck by lightning

Ships Head Degrees (True)	Previous adjustment	After Lightning on 28.12.48	After adjustment on 1.1.49	24.3.49	After adjustment on 24.3.49
000	3 W.	24 E.	2 E.	8 W.	1 E.
010		24 E.	2 E.	7 W.	1 E.
020	1 W.	28 E.	2 E.	6 W.	2 E.
030		30 E.	2 E.	5 W.	2 E.
040	1 E.	29 E.	2 E.	5 W.	2 E.
050		28 E.	1 E.	4 W.	1 E.
060		24 E.	1 E.	4 W.	1 E.
070	2½ E.	21 E.	Nil	4 W.	Nil
080		14 E.	2 W.	3 W.	1 W.
090	2 E.	7 E.	2 W.	3 W.	1 W.
100		1 W.	2 W.	1 W.	2 W.
110	½ E.	13 W.	2 W.	1 E.	2 W.
120		16 W.	2 W.	1 E.	3 W.
130	1½ W.	23 W.	2 W.	1 E.	3 W.
140		26 W.	2 W.	2 E.	3 W.
150		26 W.	2 W.	6 E.	2 W.
160	2 W.	26 W.	Nil	6 E.	2 W.
170		25 W.	1 E.	7 E.	1 W.
180	1 W.	25 W.	1 E.	10 E.	1 W.
190		21 W.	2 E.	10 E.	Nil
200	2 E.	21 W.	2 E.	10 E.	1 E.
210		21 W.	Nil	9 E.	1 E.
220	2½ E.	18 W.	Nil	8 E.	1 E.
230		16 W.	1 W.	7 E.	1 E.
240		13 W.	1 W.	6 E.	1 E.
250	3 E.	12 W.	1 W.	5 E.	Nil
260		9 W.	1 W.	Nil	1 W.
270	2 E.	5 W.	1 W.	5 W.	1 W.
280		Nil	2 W.	5 W.	2 W.
290	Nil	1 E.	2 W.	6 W.	2 W.
300		5 E	1 W.	8 W.	2 W.
310	1½ W.	7 E.	Nil	9 W.	1 W.
320		11 E.	Nil	9 W.	Nil
330	3½ W.	15 E.	Nil	9 W.	Nil
340		17 E.	Nil	10 W.	1 E.
350		21 E.	2 E.	9 W.	1 E.

again on 24th March, 1949, ten weeks later. During this period the magnetism introduced by the lightning was considerably reduced and the ship tended to revert to her original magnetic state.

François Arago in his *Meteorological Essays* reports 72 instances of ships being struck by lightning with occasional disastrous effect. An English schooner was sunk in Jamaica Harbour in 1809 and two men of war *Lynx* and *Resistance* disappeared altogether from a convoy after lightning flashes. It is safe to assume that all these reports concerned wooden ships.

The Meteorological Office records show that between 1923–1934 there were five reported cases, all involving steel ships, and possibly all with wooden top-masts. In every case it was the fore top-mast that was struck, usually with localised damage, although the *Royal Transport*, February, 1924, reported that the whole ship was shaken, causing roof of wireless room to leak and damaging wireless installation, and subsequent large deviation on her compass, on N and S courses. It is quite possible that the other ships experienced effect on compasses but failed to report it.

There are several reported instances of lightning affecting the magnetism of a compass needle and in some cases actually reversing the polarity.

To quote François Arago: "About the year 1676 two English vessels were sailing in company from London to Barbados. Not far from the Bermudas a thunderstroke shattered the mast and rent the sails of one of the ships, while the other sustained no damage. The captain of the latter, seeing that his consort had altered her course, as if making for England, asked the cause of this sudden change of purpose, and found, much to his astonishment, that her captain and crew believed themselves to be still following the same course as before."

A comparison of the vessels' compasses showed that lightning had completely reversed the polarity of the compass needle of the vessel struck.

Another instance is that of the brig *Medusa* during a passage from La Guaira to Liverpool when lighting destroyed the magnetism of four compasses on board two of which were on deck and two in the captain's cabin.

From records of wooden ships, one would presume that lightning could not only reverse the poles of a compass but also neutralise the magnetism, or change the magnetic conditions to any intermediate degree from 0° to 180°. The design of compass needles has changed with the years and the old elongated lozenge type which these observations represent are no longer used.

Later reports from the *Weather Recorder* have shown that, in her case, although the ship's magnetism was affected, the magnetic state of her compass needle was not altered.

When the *New York* was struck in May, 1827, the metal fittings, nails securing partitions and mathematical instruments were strongly magnetised, the chronometers were seriously affected, probably due to the steel components, particularly its balance wheel becoming magnetised, and a watch on the *Golymin* similarly affected still retained the magnetism so imparted twenty-seven years later.

LETTERS TO THE EDITOR

Anticrepuscular rays

Although during my last sea voyage I was not serving on board an observing ship in the VOF, I feel that the following phenomenon is worth reporting.

Having observed twilight crepuscular rays in the west a number of times, I was fascinated to see the phenomenon well pronounced in the east during a crossing of the Atlantic in August 1988. Reading the paragraph on this effect in the *Marine Observer's Handbook*, I am sure that my observation was of sufficient rarity to warrant a special report. The converging rays as seen in the east were extremely clear, being observed for about 20 minutes after sunset. As the sun moved lower below the horizon, the multiple rays formed into four main rays of two sets, two in each and extended from a convergence position of 3° above the horizon to about 70° elevation. By this time they were dense, dark blue against a pale, watery sky. Since the handbook states this strength of ray is caused by mountains below the horizon, I think there must have been, in this instance, some very dense Cu or Cb clouds in lieu of mountains as we were at the time nowhere near land.

At the time of the eastern crepuscular rays there were none visible in the west further than the 70° elevation previously mentioned. Heavy Cb clouds and rain showers obscured the sunset.

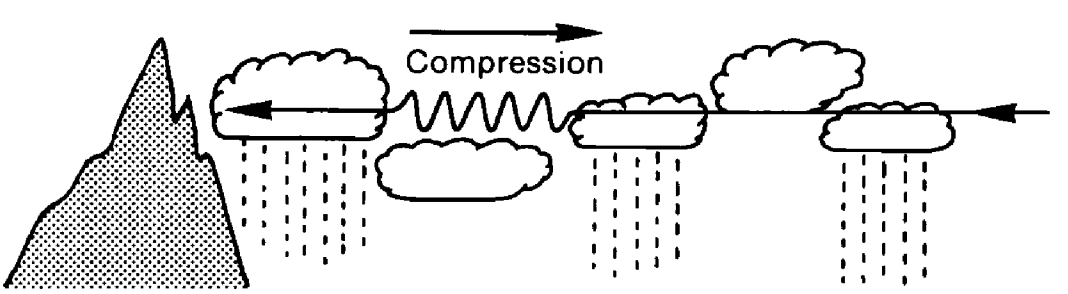
Mr W.M. Allen, 3rd Officer.

To shock the rain from the clouds

Here is another wild conjecture for consideration by the knowledgeable.

The monsoon 8/8ths cloud race over 1,000 miles over land before hitting the Himalayas and shedding the moisture carried from the Bay of Bengal.

The cloud is a mass travelling and therefore acquires momentum. If such a train of mass is abruptly brought to halt, a shock wave is set off from the impact point. A compression travels back along the mass. Such an effect is visually available when an engine suddenly has the brakes applied with a train of wagons behind.



The point I am trying to make is that the rainfall in the foothills and adjacent areas in the vicinity of the impact is understandable. But why is there a 'gap' before it rains further south? Such intermittent precipitation continues well to seaward, south into the Bay of Bengal.

Precipitation is invariably attributed to sudden temperature fall. But could such a shock wave set off precipitation along the path as well? Conversely, if such shock waves were to be artificially set off amongst the travelling clouds, could they be milked to make the deserts bloom?

Captain Somesh Chaudhuri FNI, Calcutta

Personalities

(Readers are invited to notify the Editor of observing officers retiring from the Navigating and Radio Departments.)

OBITUARY — CAPTAIN S.D. MAYL died on 4 April aged 56, shortly after becoming ill during a South Atlantic tour on the Royal Research Ship *Charles Darwin*.

Sam Mayl followed a traditional marine career, having been apprenticed to the Anglo Saxon Petroleum Company at the age of 17, remaining with that company, as Shell Tankers, until 1965. He later joined SAF Marine and was appointed Master and then Acting Marine Superintendent in 1972. However, he felt the urge to return to sea and, after a year in Whitco Marine Services refrigerated cargo ships, he joined the Natural Environment Research Council in 1975 as Chief Officer and Acting Master. He served in R.R.S.s *Discovery, Shackleton, Challenger* and *Charles Darwin*, having been made substantive Master on the latter ship in February 1989.

Sam Mayl was rightly described as one of nature's gentlemen and was, in addition, known as a 'good Antarctic waters man'; he was particularly proud of having been Master of R.R.S. *Charles Darwin* when she acted as the U.K. representative at the 70th birthday celebrations of His Majesty King Taufa'ahau Tupou IV of Tonga in July 1988. On that occasion be upstaged the other navy ships present for the event, none of them British, by putting on a display of fireworks which surprised and pleased everyone in its superiority; Captain Mayl was particularly elated that the fireworks from the navy ships appeared to be coming from the *Charles Darwin*, as he observed them from the shore whilst he dined on roast suckling pig at the King's palace.

Captain Mayl left an enviable weather observing record having provided 59 meteorological logbooks in an observing career of 23 years, with 16 Excellent books included. He received Excellent Awards in 1979 and 1980. His twin hobbies of ornithology and photography allowed him to produce many superb sea-bird photographs, and one in particular earned him no little fame. He was runner-up in the Royal Naval Bird Watching Society annual competition with a photo of a Black-browed Albatross in flight, and this was reproduced on the front cover of the April 1987 edition of *The Marine Observer*.

A good sailor, and a gentleman, Sam Mayl will be sadly missed by many and we would like to extend our sympathy to his widow and son. Our thanks to Captain M. Perry, Marine Manager, NERC, Barry, for the career information.

RETIREMENT — CAPTAIN R. BROWNBILL retired on 12 January 1989 after 42 years with ships of the Vestey Group.

Ron Brownbill was born in Mossley Hill, Liverpool, in January 1931 but soon moved to Harrow. He was educated at Chester College and Kings School, Harrow, before joining t.s. *Mercury* in April 1944 for pre-sea training. In December 1946 he joined Lamport and Holt Line Ltd, making his first voyage as Cadet in the Liberty ship *John J. McGraw* shortly afterwards. He obtained his Master's Certificate in January 1957; his first command was the *Verdi* to which he was appointed on promotion in December 1958.

Captain Brownbill transferred to Blue Star Line when the *Chatham* was taken over by them and renamed *Mendoza Star* in the 1960s, and he remained with Blue Star until his retirement. He compiled the large total of 56 meteorological

logbooks in the 25 of his sea years spent in weather data collection, and 16 of these logs were marked Excellent. For his efforts he received Excellent Awards on seven occasions. His first log came to us from the *Bronte* in September 1950.

Having been made redundant at an 'early' age, Ron Brownbill proposes to play some 'bad' golf and catch up on promised jobs left over from past years. He is happily married to a Kiwi, they have two Pomwis and live in Beaconsfield, Bucks. He is a longtime friend of TV Weatherchief Bill Giles, and the Marine Superintendent was pleased to be able to greet them together at the Office last December, and now wishes Captain Brownbill a happy and successful retirement.

RETIREMENT — CAPTAIN J.W. HODSON retired on 31 October 1988 after 42 years at sea during which time he co-operated with two different countries in voluntary weather observing.

John Hodson was born in May 1928 and educated at Annan and Dumfries Academies. After joining the Crest Shipping company of London he went to sea in his first ship, the s.s. *Rivercrest*, in October 1946, transferring a year and a half later to Anchor Line Ltd of Glasgow. His introduction to weather observing was as a Cadet on H.M. Troopship *Empire Halladale* in 1948, although this fact was not entered in the log or his records. After gaining his Second Mate's Certificate, in April 1951, he joined Ellerman & Papayanni Line of Liverpool as Third Officer, remaining with the Ellerman Group until his retirement.

Captain Hodson obtained his Master's Certificate in June 1956; when serving on the *Arcadian* between 1961 and 1964 his ship was an observer for the Israeli Voluntary Observing Fleet. He was promoted to Master in April 1964 and took command of the *Darinian*. His first meteorological logbook to come to the U.K. Met. Office was received in January 1981 from the *City of Durban* and 14 more logs followed in the 7 years of observing; 3 of these logs were assessed as Excellent. Captain Hodson was in command of the *City of Plymouth* when the MOSS equipment was first fitted to that ship in 1983 to facilitate automatic transmission of the weather reports by satellite, and again in the *Liverpool Star* when a second-series unit was installed on that ship in November 1987.

We hope he enjoys a fruitful, happy and long retirement.

Book Reviews

An Ocean in Mind, by Will Kyselka. 152 mm × 227 mm, 244 pp, *illus*. The University of Hawaii Press, 1 Gower Street, London WC1E 6HA. Price: £11.95, paperback.

The author is a geologist by training and a former professor at the University of Hawaii, who was also a lecturer at the Bishop Museum Planetarium in Honolulu. Part of his fascinating story is how a contemporary facility such as a planetarium can be used to educate a native Polynesian so that he re-discovers the lost art of sea navigation by use of the stars and the signs of the sea. Kyselka is intrigued by the ways in which we think and learn and his book is intended for the person interested in the process of learning, how to transform an ocean of information into knowledge, and then trust mind and senses to find the way to distant lands. The whole book is written in the present tense, the past being discussed naturally by the main characters in the story, and this gives it an easy

style and makes the reader part of the adventure of sailing on a voyage of discovery in the tropical Pacific.

Nainoa Thompson, a lithe, thin man of half Hawaiian ancestry, having a lively curiosity and a deep affinity for the sea, feels powerful forces impelling him toward knowing his heritage. It seems inexplicable that the native Hawaiians can have forgotten the ancient arts of navigation which were once a most natural asset; but Thompson is taught by a Carolinian navigator, Mau Piailug, whose experience of the sea has taught him how to determine latitude by merely looking at the way the stars deck the sky, and to find the land by the many signs on and above the sea that exist, if one knows what to look for. Thompson memorizes the declinations of 110 stars at the planetarium, though probably uses less than half those on the voyages from Hawaii to Tahiti and back. He learns much more about the shape of the heavens, being shown their evolution from many centuries ago to the present time. The 6,000 mile voyage is the main aim of his learning. His craft, built by the Polynesian Voyaging Society, was a double-hulled boat of 60 feet in length, constructed with modern materials but to perform as nearly as possible to the craft of his ancestors. It had a bamboo deck lashed to the hulls and a canvas covered cabin. The two masts were rigged with the triangular sails that had been seen depicted on rock carvings, though these sails were modified after a trial voyage around the Hawaiian Islands when the craft and its occupants nearly came to grief in heavy seas.

The detailed account of the voyages between Hawaii and Tahiti and back is a fascinating one, the daily perceptions of stars, sea surface and birds to formulate the course to steer by star compass are often written in the form of the thoughts of Nainoa Thompson himself. The craft is referred to as *Hōkūle'a* throughout the book; this is the Polynesian name for Arcturus, the star of happiness which passes overhead in Hawaii. The boat heads for the brightest star in the heavens, A'a, Sirius, which sits over Tahiti when it is on the meridian. The star charts and drawings explaining how they were to be used in establishing latitude and direction are very informative.

With a crew of 14 men and women and equipped with only VHF as a means of communication to keep in touch with their escort ship, the *Hōkūle'a* made a successful journey in both directions, although not without many problems. The author has woven a wonderful picture around the story of the voyages in such a way that the words flow along as smoothly as the craft itself on a calm day, and it is a difficult book to put down once started. There are also many good photographs of the boat and the varied collection of crew members who sailed in her. It is at once a tale of true adventure and of the re-discovery of an original wayfinding system used across the great expanses of the central Pacific by Polynesian natives.

J.F.T.H.

The Mutiny of the Bounty by Sir John Barrow. 130 mm × 195 mm, 376 pp., paperback. Oxford University Press, Walton Street, Oxford OX2 6DP. Price: £5.95.

Sir John Barrow (1764–1848) wrote 'The eventful history of the mutiny and piratical seizure of H.M.S. *Bounty*' for publication in 1831, when he was Permanent Secretary to the Admiralty and had access to the papers of Captain Peter Heywood, former midshipman on the *Bounty*, whose story he tells in full.

This classic of maritime history tells the remarkable story of the *Bounty*, which sailed from Spithead in 1788, bound for the South Seas. Captain William Bligh was cast adrift in an open boat with 18 loyal crew in April 1789 when many of the crew mutinied. The epic 3,600 mile voyage of Bligh and his companions from Tofua in the Tongan Group, to Timor, is the main subject of this oft re-published work, which is now the subject of several films.

The chapters cover the voyage from England, arrival and conditions on the South Pacific islands and the quest for the bread-fruit which was the original purpose of the expedition; the munity lead by Fletcher Christian and the subsequent open-boat voyage are graphically described. Then came the search by the *Pandora* for the mutineers, some of whom were found in the Society Islands, returned to England and put on trial; three of them were hanged. Meanwhile Christian had sailed on to Pitcairn's Island with seven other crew from the *Bounty*, but all save one met violent deaths, leaving one Alexander Smith with the wives brought from the other islands, to repopulate and till the land on Pitcairn. Smith, alias John Adams died in 1829, leaving a number of island survivors.

The re-publication of this work is most timely, coinciding with the 200th anniversary of the *Bounty* saga, and is certainly worth reading again but especially by those who are not familiar with the details of this remarkable true sea story.

J.F.T.H.

Operation Raleigh – Adventure Challenge by John Blashford-Snell and Ann Tweedy. 167 mm × 238 mm, 196 pp., *illus.*, paperback. William Collins and Sons Ltd, 8 Grafton Street, London W1X 3LA. Price: £5.95.

This informative book is dedicated to the enthusiastic Patron of Operation Raleigh, His Royal Highness, The Prince of Wales and it is clearly his inspiration, as well as that of Colonel Blashford-Snell that has contributed so much to this astonishing enterprise.

In this sequel to *The Start of an Adventure*, the authors narrate the second stage of one of the most exciting global adventures undertaken for young people. It took more than one thousand Venturers as far as southern Chile, to Australia and to New Zealand and to even more exotic places such as the Hunza Valley in Pakistan, Okinawa Island and Pitcairn Island in the South Pacific where descendants of the *Bounty* crew still live. The trials and tribulations of this ambitious project are not under-played but the feeling of sheer excitment and records of astonishing breakthroughs are many and clearly recorded. These records show how Operation Raleigh has offered thousands of people the reality of adventure and coping with danger, often a mere dream to so many of us.

The choice of photographs published, of which there must have been many thousands, is excellent, imparting some of the thrill that can be seen on the faces of the youthful participants, canoeing up a Papua New Guinea river in the midst of thick jungle, crossing a swinging footbridge across the wide expanse of the River Ganges or a disabled Venturer diving in this wheelchair off Wilson's Promontory, Victoria, Australia. The latter is one of the many photographs featured in colour in the book, serving to add much to the ample text.

All the tales of the expeditions made one wish that one's name was included in the complete lists of Venturers and staff given at the end of the book; and the hundreds of sponsors in the many countries, also catalogued, must have been well rewarded for their support.

J.F.T.H.

Notices to Marine Observers

CHANGE OF BRACKNELL HEADQUARTERS TELEPHONE NUMBERS

With immediate effect, the previous telephone numbers and extensions of Marine Division staff are replaced by the following direct lines:

Captain G.V. Mackie, Marine Superintendent	(0344) 855654
Captain R.C. Cameron, Deputy Marine Superintendent	(0344) 855913
Captain J.F.T. Houghton, Nautical Officer	(0344) 855916
Captain M.L.M. Coombs, Nautical Officer	(0344) 855915
Metroute (Ship Routeing) Officer	(0344) 484961, 854904
Sea Ice Officer	(0344) 854905
Marine Enquiry Bureau	(0344) 855940

To call the Office when the direct number is unknown, the switchboard is still on (0344) 420242.

APPOINTMENT TO THE NAUTICAL STAFF OF THE MARINE DIVISION AT BRACKNELL

Captain D.J. Hewitt was recently appointed to the Marine Division of the Met. Office, bringing the complement of METROUTE, the Ship Routeing Service, up to five Master Mariners, all with experience of command.

Donald Hewitt entered the School of Navigation, Warsash, in 1961 and in the following year he was apprenticed to Shaw Savill and Albion Company. He gained his Second Mate's Certificate in 1965 and continued with the same company. Since obtaining his Master's Certificate in 1971, he has continued his employment within the Furness Withy Group on container ships and bulk carriers and in recent years he has served as Chief Officer and Master of vessels under management. The first of his 16 meteorological logbooks to be sent to the Met. Office came from the passenger liner *Southern Cross* in March 1966; of these logs, 7 were 'Excellent', and he received an Excellent Award in 1970.

TIME, LADIES AND GENTLEMEN, PLEASE

When the 1988 revision of the *Ship's Meteorological Logbook* was carried out it was decided that it was no longer necessary to ask shipboard observers to leave blank the GMT column at the beginning of the second page 'for Met. Office use'. However, for computer data-logging purposes, this column is still necessary and we now ask for the GMT to be entered on the second page in all met. logs regardless of the edition and remarks to the contrary at the head of the column. To prove that old habits die hard, especially at sea, observers are still reluctant to enter the GMT a second time in the revised versions.

Fleet Lists

GREAT BRITAIN (Information dated 20.3.89)

The following is a list of British ships which have been equipped with instruments and which voluntarily co-operate with the Marine Division of the Meteorological Office.

The names of the Masters, Observing Officers and Senior Radio Officers are given as ascertained from the last written returns received. The date of receipt of the last return is given in the second column. An asterisk indicates a new recruitment who has not yet sent in a logbook.

All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent of the Meteorological Office.

The Port Meteorological Officers will make personal calls on the Masters and Observing Officers as opportunity offers, or on notification from the ship at any time when their services are desired.

Excellent Awards are made at the end of each calendar year. The names of the Masters, Principal Observing Officers and Radio Officers gaining these awards are published each July in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Master or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to a Port Meteorological Officer or to the Marine Superintendent of the Meteorological Office at Bracknell.

Masters and Officers are invited to point out any errors or omissions which may occur in the list.

Selected and Supplementary Ships

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
A.E.S.	11.1.89	H. S'Vendsen	H.S. Jensen, T.G. Jensen		Jeppesen Heaton Ltd
Abbey	28.2.89	B. Walmsley	R.A. Berry, K.P. Alcock, C.W. Jones	P.G. Corkin	Furness Withy (Shipping) Ltd
ACT 1	26.1.89	N.D.T. Johnson	A. Brown, J. Billing, I.C. Entwisle	M. Janor	Blue Star Ship Management Ltd
ACT 2	22.2.89	J. Hart	J. Gladstone, A.L. Le Goubin, I.J. McMahon	P.A. Hughes	Cunard Ellerman Shipping Services Ltd
ACT 6	23.12.88	M. Thwaite	A.M. Tweedie, M.N. Messenger, J.H. Smith		Cunard Ellerman Shipping Services Ltd
ACT 7	5.1.89	A.J. Cheshire	C.R. Mundy, J.G. Ewart, N.M. Bennett	W.T. Ashley	Blue Star Ship Management Ltd
ACT 8	14.3.89	L.R. Bell	D.A.K. Bamford, J.M. Rowe, A.D. MacPherson	C.S. Carver	Denholm (I.O.M.)Ltd
Adelaide Express	31.7.87	E.F. Lobo	G. Munjal	M.G. Chitrao	Silver Line Ltd
Al Arous	8.12.88	G.J. Ward	H.R. Shuttleworth, M.P. Green, T.C. Mukherjee	N. Matthews	Cunard Ellerman Shipping Services Ltd
Al Shamiah	23.10.78	T. Williams	P. Walley		United Arab Shipping Co. (S.A.G.)
Albright Pioneer	10.5.88	J.H. Kitching	G.P. Hodge, T. Wright, D.R. Williams	R.J. Shepherd	James Fisher & Sons plc
Aldrington	4.10.88	P.I.E. Quance	J. Young, A. MacDonald	T.S. Davies	Stephenson Clarke Shipping Ltd
Alert	18.4.88	R. Longworth	M. Swaffield, I. Smallshaw, P. Moodie	D. Vowles	British Telecom International
Alliance	*	—. Hoctschmidt	J. Graham, S. Hamer		Denholm Offshore Ltd
Almeda Star	*				Concordia Marine Co. Ltd
American Senator	6.3.89	K. Millar	R.K. D'Souza, M.A. Cully, Pankaj Sah	D.I. Masih	Anglo-European Ltd
Andes	5.1.89	T.R. Barton	D. Bowman. M. Brooks, M. Richardson	G.S. Graham	Furness Withy (Shipping) Ltd
Anro Adelaide	8.3.88	K. Yin	T. Sein, V.R. Bali	K. Zwa	Neptune Orient Lines Ltd
Appleby	23.11.88	C.R. Bamford	N.D. Ferguson, A. Crofts, P.W. Holliday	D. Leeson	Ropner Ship Management Ltd
Arctic Corsair	*	P. Wheeldon	A. Spence		Boyd Line Ltd
Arctic Universal	13.3.89	G. Pettingell	D. Jacobs, N. Jeyasriskandarajah, J.M. Wright	G.M. Tinsley	Matheson Shipping Services Ltd
Arma Trader	10.8.88	B. Jones	C.M. Goddard, A. Kumar, A. Hussain	H. George	B.C.P. Ship Management Ltd
Asifi	5.9.88	G.W. Wostenholme	M. Beeley. R.I. Sime		Britship (I.O.M.) Ltd

Atlantic Amity	19.9.88	R. Kitchener	S. Verma, R. Serem, D. Tucker	P.D. Waldron	Furness Withy (Shipping) Ltd
Atlantic Confidence	22.1.87	M.P. Jellicoe	J.C.P. Brown, R.G. Carnelley, P. Labistour	E.R. Fair	Furness Withy (Shipping) Ltd
Atlantic Conveyor	31.1.89	C.S. Kingston	S.G. Millar, D.A. Smith, P.A. Squance	A.R. Taylor	Cunard Ellerman Shipping Services Ltd
Atlantic Link	10.10.88	J. McNeill	G. Hamilton, B. Standerline, T.R. Cotton	R. Dolby	Ship-Link (U.K.) Ltd
Atlantic Universal	23.8.88	M.I. Turner	J. Colus, D. Nixon, P. De Silva	D. Hart	Matheson Shipping Services Ltd
Auckland Star	3.2.89	P. Mathews	N.J. Barr, D.G. Robbie, R.G. Pressler	R. Knott	Blue Star Ship Management Ltd
Aurora	17.2.89	L.J. Hesketh	N.J. Adams, R.K. Srivastava, R.B. Singh	B. Ravindran	P. & O. Ship Management Ltd
Author	26.1.89	R. Smith	G. Laird, B. McCleery, D.J. Mayhew	M. Sheldon	T. & J. Harrison Ltd
B.P. Advocate	19.1.89	R.C. Stevens	J.G. Dixon, D.A. Castor, E.A. Ebarle	B. Brycki	B.P. Shipping Ltd
B.P. Architect	*	M. Pocklington	P.F. Armitage, F. Gale, C. Barranta	M. Alueta	B.P. Shipping Ltd
B.P. Energy	24.2.89	F.W. Wilkinson	S.G. Stjernberg, D.N. Goswami, K.K. Mukherjee	B. Godwin	B.P. Shipping Ltd
B.P. Harrier	5.6.85	D. Hamilton	P.M. Bowers, I.V. Hawkeswood		B.P. Oil Ltd
B.P. Humber	19.7.88	C.N.B Burley	J.L. Atkins, A.M. Plows, D.J. O'Neill	R. Bartolomeiski	B.P. Shipping Ltd
Baltic Eagle	8.3.88	D.R. Cripps	M. Kearney, J. Ghest, R.H. Barker	P. Hornby	United Baltic Corp. Ltd
Baltic Link	*	J. Gault	J. Hewitt, O. Watson		Ship-Link (U.K.) Ltd
Baltic Progress	7.6.88	R.C. Kreamer	R.M. Raybould, J.D.R. Ghest, D. Torr	R.D. Caple	United Baltic Corp. Ltd
Baltic Universal	16.3.89	T.W. Abbott	I.V. Hughes, W.J. Turner, A.N. Mudilage	D.G. Gavin	Matheson Shipping Services Ltd
Barbara E	18.10.88	D. Tyler	T.W. White, D.B. Waddingham		Britship (I.O.M.) Ltd
Barrydale	9.3.89	J.J. Robinson	P.E. Harwood, M.G. Narayan, F.R. Panthakee	M.V. Rosario	E. & F. Shipping Ltd
Ben Ocran Lancer	17.6.87	A.I. MacFeate	S.D.R. Campbell, D. Gilmour, T.V. Roberts	H.M.S. Cherry	Ben Odeco Ltd
Benalder	24.1.89	J.L. Walterson	J.H. Clark, D. Bathgate, S.S.M. Smith	J. Ryan	Ben Line Steamers Ltd
Benavon	6.2.89	F.G. Anderson	L.D. Thomson, H.A. Blain, A. Murray	R.A.M. Lynn	Ben Line Containers Ltd
Benhope	8.6.88	R.E. Cowie	D.K. Selvan, P.H. Dalal, A.D. Picardo	M.Y. Choudhary	Ben Line Steamers Ltd
Benlomond	15.6.88	D.M. Staff	A.W. Campbell, G.J. Livingston, M. Pantakas		Ben Line Steamers Ltd
Binsnes	17.1.89	D.M. Taylor	S.H. Barnet, J.H. Donne, G.P. Read	W.P.F. Swann	Jebsens Ship Management Ltd
Birchwood	8.7.88	M.A. Whittle	S.G. Beadle, M.V. Dolan, A.F. Ure		Buries Markes (Ship Management) Ltd
Bluestream	27.2.89	C.J.B. Trinick	J.C. Birkenhead, I.Y. Juwale, S.A. Jaitapakar	U.R. Sompura	E. & F. Shipping Management Ltd
Bolnes	22.2.89	A.M. Smart	S.C. Benstead, I.J.H. Grainger, J.P. Warren	A.G.S. Sirkett	Jebsens Ship Management Ltd
Bora Universal	24.11.88	R.M. Bessant	G.R. Plummer, S.J. Jenkins, M.Y. Kamal	P.G. Morgan	C.I. Shipping Ltd
Bransfield	18.5.88	S.J. Lawrence	N.A. Beer, A.M.J. Reading, G.T. Hobbs	S.J. Mee	British Antarctic Survey
Bridgeman	6.1.87	F. Craske	M.J. McGhee, P.S. Wright, M.D. Kerr	R.I. Gow	Rowbotham Tankships Ltd
British Beech	24.1.89	I.M. Peterson	S. Ding, C. Beaton, D.M. Sharp	D. Walker	B.P. Shipping Ltd
British Esk	17.1.89	J. Perry	G. Hallett, N.G. Hawkes, C.J. Burt	S. Mackenzie	B.P. Shipping Ltd
British Forth	6.12.88	G.M. Hopkins	N.J. Collins, J.S. Kampani, J. Jhamb	M.C. Wakelin	B.P. Shipping Ltd
British Ranger	10.3.89	H.E. Brown	S.R. Mitchell, T.I. Roberts, D.J. Lavery	D.C. Ogden	B.P. Shipping Ltd
British Reliance	2.3.89	K.E. Peacock	G.A. Inseal, R.C. Stewart, A.J. Fitch	P. Williams	B.P. Shipping Ltd
British Renown	17.2.89	M.J. Searle	J.R. Gipson, K. Patterson, C.D. Donoso	D.A. Richards	B.P. Shipping Ltd
British Resolution	12.12.88	J.A. Buchanan	R.G. Smith, A. Crichton, Q.N. Cox	C. Taylor	B.P. Shipping Ltd
British Resource	11.1.89	M.C. Roberts	A.J. Drew, A.J. Cable, D. Robertson	P. Gould	B.P. Shipping Ltd
British Respect	5.1.89	R.H. Friar	J.C. Patterson, A. Parkinson, A.P.J. Hilliard	W. Quinn	B.P. Shipping Ltd
British Security	18.10.88	S.R. Montague	J. Dolan, P.B. Loughran, D. Mulhearn	P.E. Davies	B.P. Shipping Ltd
British Skill	30.11.88	T.T. Nixon	S. Allibone, S. Noonan, K.M. Gregg	J. Tomlinson	B.P. Shipping Ltd
British Spirit	10.3.89	L. McGeogh	C.R. Shoolbraid, J. Harris, R.A. Hawkins	M. Glendinning	B.P. Shipping Ltd
British Steel	24.11.88	R. Whistler	R. Gibbons, P. Newman, A.T. Rowe	J. Miller	Furness Withy (Shipping) Ltd
British Success	26.1.89	J.L.W. Dwight	G.H. Spence, P.N.W. Collings, S. Davies	P. Ruddick	B.P. Shipping Ltd
British Tamar	18.10.88	P.T. Morris	O.J. Pointon, R.J. Atkins	P.F. Rogers	B.P. Shipping Ltd
British Tay	7.3.89	M.R. Mansbridge	J.N. Gregson, A.J. Cable, T.T. Latto	J. Sutherland	B.P. Shipping Ltd
British Trent	11.1.88	A.R. Wilkinson	P.R. Anderson, W.M. Perkin, C. Billing	J. Yates	B.P. Shipping Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
British Trident	20.12.88	N. Greig	R. Standing, V. Williams, H. Cassidy	S. Oska	B.P. Shipping Ltd
British Wye	27.9.88	P.F. Robinson	T.J. Ashby, A.A. Facey, S.P. Golden	S.A. Weber	B.P. Shipping Ltd
Broompark	8.2.89	S.H. Baker	M.J. Murzello, G.P. D'Souza, P.F. Arsiwala	R. Monteiro	Denholm Ship Management Ltd
Buffalo	8.7.88	J.D. McCann	K.N. Metcalfe, M.E. Ingham, J. Gage	C.S. O'Sullivan	P. & O. Ferries Ltd
C.G.M. Provence	14.3.88	D. Skillander	R.C. Bourne, N. Jardine, K.A. McGeorge	P. Body	T. & J. Harrison Ltd
Cable Protector	*	E.E. Turner	P.S.D. Worrall, R. Malcolm		Cable & Wireless plc
Cable Venture	17.2.89	J. Philips	B. Sharp, R. Hall, D. Harnett	D. Woods	Cable & Wireless plc
Cableman	6.1.86	J.H. Bates	N.A. Lovesy, H.A. Williams	R.R. Hughes	Rowbotham Tankships Ltd
Canada's Tomorrow	*				Canada's Tomorrow Discovery Corp.
Canadian Explorer	15.11.88	D.R. Llewellyn	J. Huddleston, G.R. Jackson, P.K. Leech		Orient Overseas Container Line Ltd
Canberra	7.3.89	M.V.N. Bradford	R.G. Meikle, F.A. Wales, A.C. Jacobs	J. Duffy	P. & O. Ship Management Ltd
Canmar Ambassador	17.2.89	F.K. Gordon	J.H. Harton, S. Kala, R.K. Singh	D.G. Samant	B.C.P. Ship Management Ltd
Canmar Europe	8.3.89	N. Fonteyne	Dirk De Nutte	D. Piette	Orient Overseas Container Line Ltd
Canmar Venture	28.9.88	D.N.B. Nutman	B.C. Scott, S. Singh, R. Sondhi	E.F.X. Rebello	B.C.P. Ship Management Ltd
Canterbury Star	9.3.89	H.K. Dyer	P. Richards, B. Morrison, I Cousins	P. Haslam	Blue Star Ship Management Ltd
Cardigan Bay	10.2.89	P.J. Clark	K.W.S. MacMillan, P. Bowett, M.R. Greenslade	T.J. Smith	P. & O. Containers Ltd
Caribbean Universal	–.6.88				Matheson Shipping Services Ltd
Cartagena	17.2.89	D.S. Ritchie	M.T. Elmer, P.I. Ramos, C.S. Reyes	S. Silang	Denholm Ship Management Ltd
Cavendish	*				Furness Withy (Shipping) Ltd
Cedarwood	*	S.L.L. Buckley	I. Nicholson, H. Nutt, A. Hall		Buries Markes (Ship Management) Ltd
Celtic Ambassador	15.3.89	C.E. Thomas	O.C. Namurach, A.H. Augbaya, A.P. Maclean		C.M. Willie & Co. (Shipping) Ltd
Celtic Challenger	29.9.88	I.K. Rew	A.C. Wehner, A.P. MacLean, I.R. Salter		C.M. Willie & Co. (Shipping) Ltd
Celtic Mariner	13.12.88	C.J. Hughes	E.K. Andoh-Wilson, N.R. Parker, I.G. Swales		C.M. Willie & Co. (Shipping) Ltd
Celtic Voyager	6.3.89	H.J. Norton	B.W. Bedworth, J.M.S. Lethbridge, J. Wigley		C.M. Willie & Co. (Shipping) Ltd
Challenger	26.9.88	G. Long	P.A. Evans, P.T. Oldfield, W. Campbell		Natural Environment Research Council
Charles Darwin	17.1.89	P. Maw	K.O. Avery, R.J. Chamberlain, G. Proctor	J. Baker	Natural Environment Research Council
Chelsfield	17.1.89	P. Hodge	M.S. Brocklesby, S. Woodhouse, L.H.R. Fernando	N.J. Cawthorne	Buries Markes (Ship Management) Ltd
Churchill	3.2.89	J. Rowe	M.J. Power, S. Rathbone, M. Ellis	I.R. Shaw	Blue Star Ship Management Ltd
Cirolana	3.1.89	M.J. Willcock	R. Taylor, R. Graham, R. Woodhouse	R. Baty	Ministry of Agriculture, Fisheries & Food
City of Edinburgh	7.3.89	D.D. Sutherland	M. Roberts, A.J. Smith, N. Walker	D.N. Barlow	Ben Line Containers Ltd
City of Plymouth	1.2.89	S.H. Duckworth	P.W. Jackson, S.R. Allaker, A. Clark		Denholm (I.O.M.) Ltd
Claymore	11.8.87	J. Campbell	M.B. Scott, C. McCurdy, D.M. Richmond	W. Ward	Caledonian MacBrayne Ltd
Clydebank	11.1.89	A.T. McGregor	M. McKenzie, P. Hill, D.S. Sime	R. Collins	Bank Line Ltd
Cordoba	*	R.I. Crawford	J. Coleman, S. Ruiz, E. Walmsley	S. Pinch	Cardiff Ship Management Ltd
Cormorant Arrow	11.1.89	J.M. Stanaway	E.W. Inkster, W. Daniel	D.H. Hibbert	Gearbulk Ltd
Corystes	24.3.89	J.R. French	B.A. Chapman		Ministry of Agriculture Fisheries & Food
Criscilla	*	J. Nichols	A. Somerton, W. Wilson		J. Marr & Son Ltd
Dallington	22.4.86	R. Thompson	D.W. McAlpine	I. Blenkinsopp	Stephenson Clarke Shipping Ltd
Dawpool	8.7.88	J.A. Chapman	Shakeel Azim, Anjum Hussain		C.M. Willie & Co. (Shipping) Ltd
Devonshire	28.9.88	J.K. Allison	J.D. MacKenzie, R. Holness, P. Kyprianou	G.J. Simpson	Bibby Line Ltd
Direct Kea	10.2.89	P.A.E. Sambrook	J.G.W. Dixon, B.J. Coupland, F.M. Leahy	C. Constantinou	P. & O. Containers Ltd

Direct Kookaburra	6.1.89	D.C. Blackman	B. Graham, N.E. Lehmann-Taylor, D.P. Crowley	W.H. Coventry	P. & O. Containers Ltd
Discovery	8.2.89	P. MacDermott	W.D. Coverdale, S.B. Beal	B. Donaldson	Natural Environment Research Counci
Donnington	31.3.87	W.G. McNaughton	K.J. Monday, A. Bourn	I. Blenkinsopp	Stephenson Clarke Shipping Ltd
Drupa	21.11.88	C.G. Pogue	M.R.J. Creighton, N. Kelley, G.L. Pattison	D. Watson	Shell Ship Management Ltd
Durrington	15.6.88	D. Patrickson	K. Whittaker, A. Fraser, M.B. Wdowikowski		Stephenson Clarke Shipping Ltd
Eastella	21.6.88	P. Taylor			J. Marr & Son Ltd
Ebalina	30.11.87	W.N. Bradbrook	G.J. Barber, A.W.S. North, D. Copeland	D.H. Parkes	Shell Ship Management Ltd
Eburna	24.1.89	J.P. Taylor	J.F. Lancaster, J.B. Wilson	K. Roberts	Shell Ship Management Ltd
Echoman	6.5.87	I. Storie	M. Thomason, G.H. Beaumont, J.W. Wilson	G. Duffield	Rowbotham Tankships Ltd
Edinburgh Fruid	3.1.88	H.G. Gray	G. Singh, C. Shetty, N. Kapur	X.L.B. Vaz	Ben Line Steamers Ltd
Edinburgh Talla	8.12.88	M.D. Humby	R.S. Basford, N.M. Dan, S.C. Sharma	K.P. Khopkar	Ben Line Steamers Ltd
Elgurdabia	6.8.86	J.W. Niblock	R.J. Bridge, M.E. Lacey, S. Westrip	A.G. Thomson	Manx Ship Management Ltd
Elizabet	17.12.87	L.G. Relton	G.F. Lack, T.S. Moseley		Hudson S.S. Co. Ltd
Elk	11.10.88	M.R. Godfrey	R.W. Madden, R.D. Henderson, K.J. Wilson	G. McDanielson	P. & O. Ferries Ltd
Encounter Bay	13.3.89	T.L. Watson	A.E. Spencer, S. Barraclough, E.P. Mullan	R.B. Redhead	P. & O. Containers Ltd
Endeavour	9.1.89	R. Pitts	P. Helm, M.E. Sands, D.J. Clark	J. Turner	Souter Shipping Ltd
English Star	21.12.88	H.K. Dyer	P.A. Owen, P.J. Brown, R.J. Fullwood	J. Carter	Blue Star Ship Management Ltd
Entalina	17.2.89	M. Ayech	S. Holt, A. Batten, N.J. Walker	D. Parkes	Shell Ship Management Ltd
Enterprise	20.9.88	B.G. Longley	W. Brothers, W.T. Lawrie, K. Henderson	R.E. Tucker	Souter Shipping Ltd
Equinox	6.12.88	T. Robinson	D.J. Pratt, J.M. Towler, J. MacDonald	C.M. Curran	Souter Shipping Ltd
Erinna	29.2.88	H.L. Graham	K. Daubner, M. Watts, U.E. Hall	M.A. O'Brien	Shell Ship Management Ltd
Ervilia	11.12.87	J. Rafferty	A.D. Lowrey, J.G. Tarling, A.W. Batten	N.A. May	Shell Ship Management Ltd
Esplanade	20.12.88	I. Beetham	K.G. Webb, J. Barrett, H.A. James	M.J. Hennessy	Souter Shipping Ltd
Esso Aberdeen	15.7.88	T. Ramsey	J.H. Donaldson, P.M. Beevers		Esso Petroleum Co. Ltd
Esso Demetia	3.2.89	D. Boler	N.M. Sly, A.M. Hoare, K. Hewlett	N. Banda	Esso Petroleum Co. Ltd
Esso Fife	11.1.89	A.J. Washbourne	T.J. Lowe, W.A. Gundry, G.R. Dunkley	A.J. Christopher	Esso Petroleum Co. Ltd
Esso Tees	17.11.88	M. Jones	J. Holmes, A.C. Lowe, R.C. Moss	P. Birt	Esso Petroleum Co. Ltd
Etrema	1.2.89	J.T. Little	M.D. Potts, A. Murray, J.W. Wibberley	M.A. O'Brien	Shell Ship Management Ltd
Eulima	25.1.89	D. Collins	D. Cotterell, M. Stoddart, G. Young	B.J. Mullally	Shell Ship Management Ltd
Eulota	8.3.89	D.R. Salmon	A.D. Guillaume, J.C. Kaighin, I.P. Denham	A.B. Stewart	Shell Ship Management Ltd
Euplecta	13.4.88	J. Brown	I. Shields, C.S. Bull, N.G. Mushet	M. Adams	Shell Ship Management Ltd
Europa Point	6.12.88	I.C. Dorse	Asghar Ali Shah, Mohammed Gulzar, Mohammed Zakir	Azizul-Haq	Acomarit (U.K.) Ltd
Eye of the Wind	12.1.83	R.S. Grono			Adventure under Sail
Falcon Arrow	9.11.88	D. MacKinnon	S.R. Crowe, M.R. Nosrati-Tehrani, M.A. Linney	M.L. Kershaw	Jardine Ship Management Ltd
Falklands Desire	18.1.89	G.J. Tully	I.M. Maden, C.D. Levesley, M. Hunter		J. Marr & Son Ltd
Falklands Right	18.1.89	A.W. Barkworth	C. Taylor, N.S. Danning	D.R. Legge	J. Marr & Son Ltd
Farnella	18.10.88	J.D. Cannan	J. Davies, R.P. Holliday		J. Marr & Son Ltd
Festival	14.4.88	M. Izhar-Ul-Haque	A. Sattar, A.H. Zubair, M.A. Ullah	A. Hussain	Gulf (Shipowners) Ltd
Fleetwave	20.9.88	J.E.S. Sturgess	R.V. Clark, V. Bhandari, B.A. Ryan	D. Saharay	E. & F. Shipping Management Ltd
Flinders Bay	6.1.89	D.A. Dornom	D.K. MacCorquodale, L.H.M. Johnson, S.J. Edge	J. Bridge	P. & O. Containers Ltd
Fort Assiniboine	18.1.89	P.H. Hill	B.C. Scott, R.R. Jatar, J.J. Alapat	R. Aurora	B.C.P. Ship Management Ltd
Fort Garry	26.1.89	D.P. Cockrill	S. Mundy, G.P. Chapman, L. Attri	M.T. Panindre	B.C.P. Ship Management Ltd
Fort Rouge	20.3.89	D.A. Tipping	P.N. Ratcliffe, B.N. Chakraborty, M. Sangal	C.P. Upadhyay	B.C.P. Ship Management Ltd
Fort St John	11.3.87	A. Stobbs	G.D. Weaver, J. Dalisay, M. De Filipe	A. Lagrido	Wallem S.M.S. (I.O.M.) Ltd
Fort Steele	25.5.88	D.A. Tipping	P.N. Ratcliffe, A.J. Bentley, M.W. Jubb	P.D. Hartwell	B.C.P. Ship Management Ltd
Fort Toronto	19.1.89	K.W. Elias	S.J. Allen, R. Sarda, K.B. Dev	W.M.G. Mascarenhas	B.C.P. Ship Management Ltd
Forthbank	9.2.89	P. Simpson	C.J. Butters, D.E. Ginder, K.P. Mowat	J.C. Yates	Bank Line Ltd
Fremantle Express	3.2.89	E.F. Lobo	M.K. Luthra, A.M. Khainar, R.K. Goel	D.G. Bhide	Silver Line Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Frio Chile	*				Lomar Shipping Ltd
Fullnes	1.2.89	J.C. Somosot	J.G. Bequilla, E.L. Aquino Jr, R.R.M. Ramos	M.S. Sallave Jr	Jebsens Ship Management Ltd
Ga Chau	2.4.86	H. Connell	A.E. Regan, J.P. Martlew, D. Paul	S.A. Lamb	Denholm Ship Management Ltd
Gardline Locater	15.8.88	P.C. Hewitt	K. Scott, A. Graveson		Gardline Shipping Ltd
Gas Enterprise	2.3.89	M.D. Salmon	D.R. Lewis, D.J. Williams, B.J.V. Cook	P.K. Kielthy	B.P. Shipping Ltd
Geestbay	27.2.89	D.N. Boon	W.A. Boddington, K.B.Henry, H.C. MacKenzie	P.A. Lindley-Curtis	Geest Line Ltd
Geescape	8.2.89	C.J. Flanagan	D. Roberts, J. Hickey, J. Williams	P. Prophet	Geest Line Ltd
Geesthaven	22.2.89	M.G. McDonald	J.R. Parfitt, R.J. Hawkins, M.H. Kenny	T. Gilmour	Geest Line Ltd
Geestport	17.2.89	R.A. Cole	A.J. Gladman, D. Buckingham, S. Allen	J. Donnan	Geest Line Ltd
Gold Varda	30.10.85	R.M. Mitchell	R. Borkowski, S.J. Windle, R. Ross	D.H. Logie	Haverton Shipping Ltd
Golden Fleece	21.3.88	A. Mair	C.S. Swarnakar, S.R. Sukhrani, R. Kapuria	P. Srikant	Ugland Bros. Ltd
Graiglas	7.11.88	G. Watson-Wood	F.J. Nichol, M.R. Gover, S.G. Fraser	K.P. McCarthy	Graig Shipping plc
Graigwerdd	15.3.89	E.M. Holmyard	B. Hardy, J. Cataluna, E.L. Austria	C. Dequilla	Graig Shipping plc
Greenpeace	15.9.88	R.A. Graham	M. Gotgz, K. Ballard, B. Clark		
Gulf Speed	*	P.K. Sharda	B.S. Duggal, V.M. Damley, H.P. Goiporia	B. Roy	Cunard Ellerman Shipping Services Ltd
Gulf Spirit	11.1.89	N. Passey	N.C. Tewari, P.P. Jhonn, S. Mukhtar	B.S. Unnithan	Cunard Ellerman Shipping Services Ltd
Hampshire	19.1.89	R.A.F. Edwards	A.G. Smith, J.E. Docker, D.C. Rands	B. Dickinson	Bibby Line Ltd
Harefield	5.12.88	J. Rideout	T.T. George. C. Blacker, R.N. Elikewela	A. Gunasekara	Buries Markes (Ship Management) Ltd
Harold La Borde	12.10.88	D.C.S. Farquhar	A.G. Smith, P.M.N. Marsham, A. Mohammed	D. Stapleton	Bibby Line Ltd
Havdrott	3.3.88	J.D. Owen	J.D. Hogg, T.H. Paterson, A. Capadosa	W.K. Ryan	A/S Havtor Management
Havjarl	31.1.89	P.R. Malarky	P.J. Tyson, I. Tagab, M.G. Dalman	K.S. O'Sullivan	A/S Havtor Management
Havkong	6.1.89	C.A. Hatcher	K.W. Newman, C.M.J. Paxton, D.C. Alcaraz	W.K. Ryan	A/S Havtor Management
Havprins	*				A/S Havtor Management
Hebridean Isles	18.10.88	A.J. Morrison	W. Skivington, D.A. Gunn, I.F. Scarr	W. Ward	Caledonian MacBrayne Ltd
Hekabe	9.8.88	V. Cook	M.G. Charnley, B.C. Pritchard, D.D. Apura	N.W. Harrison	Rederiet H.R. Myhre A/S
Helikon	27.9.88	P.R. Dew	J.D. Martin, D. Bolasoc, R. Tan	M. McKenny	Rederiet H.R. Myhre A/S
Hemina	21.11.88	C.S. Robinson	K.W. Bennett, I.D. Gordon, M.S. Arreglo	K.W. Torr	Rederiet H.R. Myhre A/S
Hermod	6.1.89	N. Gill	T.W. Ferguson, J.M. Graig, M.G. Dalman	B. Wynne	Rederiet H.R. Myhre A/S
Hesiod	19.1.89	C.S. Robinson	K. Fraser, N.J. Blacker, D. Tomlinson	A.D. MacGillivray	Rederiet H.R. Myhre A/S
Highland Reel	8.4.87	C. Green	D. McIntyre, G. Collier, D.J. Cowie	D. Gavin	Ugland Marine Ltd
Hill Cove	14.3.88	T. Doyle	M. Wainman		J. Marr & Son Ltd
Hoegh Duke	4.1.89	C.V. Farrant	N. Elks, J.D. Remedios, P. Malhotra	F. Rodriques	Leif Höegh (U.K.) Ltd
Humanist	7.3.89	M.J. Feltham	Lam Tak Keung, M.A. Malek, F. Adjaben	A. Jabbar	Ocean Tramping Ltd
Hupeh	25.10.88	P. Barton	P.T. Clegg. Poon Chi Kwong, R.T. Mahmood	Lee Hung Kin	China Nav. Co. Ltd
Ibn Abdoun	15.12.87	A. Gupta	H.S. Sant, P. Verma, N. Jarrar	S.K. Datta	United Arab Shipping Co. (S.A.G.)
Ibn Rushd	8.4.87	P.W. Roberts	A. Suddaby, Hisham Almajali, M.A.K. Ibrahim	M. Patten	United Arab Shipping Co. (S.A.G.)
Indiana I	*	J. Jones	F. Khaun, E. Casson		J. Marr & Son Ltd
Iolair	16.3.89	I. Ferguson	I.G. Chadwick, M.T. Fisher, J.D. Cawsey	R.J. Lodge	B.P. Shipping Ltd
Irma M	1.2.89	P.G. Pinkerton	C. Bunt, S. Chawla, D.J. Moos	A.K. Das	E. & F. Ship Management Ltd
Iron Bridge	17.2.89	P. Creber	D. Lyon, J. Hollamby, G. Woodall	D. Hobson	Furness Withy (Shipping) Ltd
Isle of Arran	9.1.89	S. Findlay	A.J.T. Gray, T.G. Wilson, I.B. McCaskie		Caledonian MacBrayne Ltd

Isle of Mull	25.3.88	C.W. Billimore	R. Morrison, A. Colquhoun		Caledonian MacBrayne Ltd
Isocardia	12.2.89	J.P. Bateman	P.E. Davidson, R.J. Collier, R. Orange	J. Mercer	Shell Ship Management Ltd
Isomeria	22.7.88	J.G. Ruffell	S. Gallaway, A. Cormack, A.C. Davis	G.C. Graham	Shell Ship Management Ltd
Iver Alke	25.1.89	A. Mendonca	J.S. Rathaur, V. Vij	J.R. Jesia	B.C.P. Ship Management Ltd
Iver Tiki	22.7.88	R.M. Barber	J.S. Sahi, P.J. Griffiths, M.V. Varma	J.P.L. Colaco	B.C.P. Ship Management Ltd
Ivybank	25.10.88	P.J. Elder	W. Mather, J.C. Osman, A. Haynes	G.B. Randall	Bank Line Ltd
Jahre Princess	*	T.S. Nurcombe	K.M. Tripathi, R. Kumar, S.B. Bhalla	S.B. Ramnani	Wallem Ship Management (Hong Kong) Ltd
Jasmine B	6.9.88	R.B. Stephens	G.R. Hicks, J.G. Worthington, P.J. Fernandez	D. Cowhig	Beta Maritime Services Ltd
John Biscoe	4.5.88	E.M.S. Phelps	M.J.S. Burgan, J.R. Harper, G.C. Morgan	K.M. Janczak (Miss)	British Antarctic Survey
Jostelle	22.1.88	J. Burt	K.A. MacLeod, P. Thompson, P.V. Curran	P. Byers	Souter Shipping Ltd
Keta Lagoon	29.6.88	A.N. Kwaw	A. Darko, M.A. Gavor, H. Afful (Mrs)	S.S. Abrokwa	Black Star Line Ltd
Kingsnorth Fisher	14.4.88	J. Sharples	H..C. McWilliam, E.W. Casson, R. Borkowski	S. Price	James Fisher & Sons Ltd
Kowloon Bay	30.1.89	J.S. Thorpe	K.W. Smith, R.J. Hughes, D.R. Peel	D.B. Millar	P. & O. Containers Ltd
La Chacra	21.11.88	T.A. Forrest	D.A. Lemon, I.C.W. Bennett, P.J. Mahoney	T. Lowe	Buries Markes (Ship Management) Ltd
Lackenby	21.12.88	T.F. Jones	S. Honey, K. Bryant, S.G. Leitch	W.B. Campbell	Ropner Ship Management Ltd
Lakenes	20.2.89	T.A. Smith	R. Baker, S. Doughty, W.D. Russell	P.F.J. Kelly	Buries Markes (Ship Management) Ltd
Lampas	24.1.89	E. Wilkinson	J.W. Arnolt, A.R. Wynne, N. Barrington	D.M. Dalton	Shell Ship Management Ltd
Lanark	3.12.87	M.J. McGilvray	N.C. Davidson, A. Pitcher, D. Rae	D. MacIver	Blue Star Ship Management Ltd
Lancasterbrook	17.2.87	I. Anderson	S.D. Clarke, D.A. Hughes		F.T. Everard & Sons Ltd
Lantau Trader	18.10.88	C.D. Riley	M.D.S. Choudhury, M.D. Nuruallah, Pang Man Sham	Chan Sheung-Kui	T. & J. Harrison Ltd
Larkfield	16.12.88	M.G.H. Phipps	N.A. Beal, M. Holmes, A.R. Krishnamoorthy	R. Jayatileke	Buries Markes (Ship Management) Ltd
Lavender	18.1.89	R.D. Berryman	R.L. Redding, S.A. Crow, A.R. Pradhan	D.J. Kelly	Beta Maritime Services Ltd
Leicesterbrook	11.8.86	J.J. Myles	W.G.S. Williams, C.G. Buckley		F.T. Everard & Sons Ltd
Leonia	19.12.88	A.F. Devanney	J.L. Galbraith, R. Mellor, N. Parkes	L.J. Elderfield	Shell Ship Management Ltd
Lerma	10.11.88	R.I. Crawford	R.W. Davies, V.M. Flores, Dionicio S. Rendon	K.H. Sellar	Cardiff S.M.S. Ltd
Leslie Gault	24.6.88	R.R. Williams	C.S. Tinlay, T. Nyunt, M.P.S. Flynn		Denholm (I.O.M.) Ltd
Lima	26.1.89	C.E. Jarrett	M.B. McHugh, M.R. Hill, G.A. Szulc	R.E. Haviland	Shell Ship Management Ltd
Lincolnshire	20.2.89	M.R. Nisbet	B. King, D. Cramer, K. Dharamdass	G.J. Simpson	Bibby Line Ltd
Lincoln Universal	23.12.88	M. Colley	A.R.V. MacPherson, R.M. Hutchinson, H.U. Wimal	J.D.P. Jones	Matheson Shipping Services Ltd
Liverpool Bay	6.3.89	A.J. Palmer	D.L. Batchelor, K.P. Ireland, S.H. Pearce	C.R. Brooks	P. & O. Containers Ltd
Liverpool Star	22.11.88	J.W. Hodson	J.D. Foley, G.D. Corbett, J. Murray		Denholm (I.O.M.) Ltd
Lough Foyle	*	A. Niblock			Heyn Engineering & Shipping Service
London Express	*	J. Bernimolin	S. Ryckebusch, F. Van Mechelen, F. Bodeux	G. De Bontridder	CMB N.V. S.A.
London Spirit	3.2.89	A.D. Gillie	M.C. Littlewood, T.C. Swatton, M.J. Webber	I. Alexander	London & Overseas Freighters plc
London Victory	17.11.88	E.G. Humby	C. Bailey, R. Fullagar, M.A. Pearce	C. Stuart	London & Overseas Freighters plc.
Lord Nelson	*	J. Fisher	D. Neale, J. Clay, J. Green		Jubilee Sailing Trust Ltd
Lumiere	23.7.87	C.D. Croall	P.R. Kaye, P.C. Youe, I.J. McMahon	B.C. Miller	Cunard Ellerman Shipping Services Ltd
Luminence	24.4.87	B.D. Fern	H.J. Everington, H.J. Pugh		Crescent Shipping Co. Ltd
Luminetta	15.6.88	J. Hart	D.S. Hughan, J.H. Howe, I.J. McMahon	C. Hardie	Cunard Ellerman Shipping Services Ltd
Maersk Cadet	4.10.88	R.M. Banton	S.J. Bracewell, R.A. Pemberton, D. Yorke	J.J. Walsh	Britship (I.O.M.) Ltd
Maersk Commander	*	R.M. Banton	R. Crook, R. Hulme, T. Waller	M. Patten	Britship (I.O.M.) Ltd
Maersk Gannet	30.9.88	S. Lyons	I.A. Leak, T.J. Workman, G.J. Hagon	M.H. Stalker	Britship (I.O.M.) Ltd
Maersk Harrier	16.10.87	G. Daykin	L.E.A. Martin, A. Mathieson, G. Whitehead	G. Smith	Britship (I.O.M.) Ltd
Maersk Navigator	2.3.89	M. Guy	W. Munro, N.G. Barratt, P.M. Reid	N. Taylor	Britship (I.O.M.) Ltd
Maersk Nestor	6.2.89	D.A. Tate	D.C. Hiddleston, R.J. Westwater, P. Messenger	T.F. Scott	Britship (I.O.M.) Ltd
Maersk Nimrod	*	K. Singer	C. Robinson, S. Reed, F.H. Peermohamed	I.J. Cameron	Britship (I.O.M.) Ltd
Maeterlinch	*	J. Bertin	P. Bogaerts, J. Van Tomme, E. Donnay		CMB N.V. S.A.

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Mairangi Bay	27.1.89	I.W. Collister	L. Nelson, D.R. Lewis, R.O. Jolliffe	S.J. Bradshaw	P. & O. Containers Ltd
Mairi Everard	24.4.87	L.A. Davis	B.R.F. Cox	W.J. Strafford	F.T. Everard & Sons Ltd
Mark - C	15.7.88	S. Smith	M. Hawkes		Carisbrooke Shipping Ltd
Matco Avon	20.12.88	J.M. Bell	B. Douglas, H.M. Murray, I. Collins		Mobil Shipping Co. Ltd
Matco Clyde	14.3.89	I.D. McKenzie	B. Marson, R. Skene, D.S. Sim		Mobil Shipping Co. Ltd
Matco Thames	15.3.88	C. Mottram	N.J. Cooke, P.A. Edwards, C.J. Graham	P.E. McMahon	Mobil Shipping Co. Ltd
Mediterranean Shearwater	1.10.87	F.P. Garbutt	J.M. Stafford, A.J. Howlett, K.M. MacDonald	S.J. Thewlis	James Fisher & Sons plc
Melampus	28.2.89	G.C. Vickery	P.C. Thornloe, D.F. Moorton, G.D. Dockerty	W.H. Cartwright	Ocean Fleets Ltd
Memnon	1.2.89	H.R. Lawton	J. Wrigley, D. Littler, P.E. Sherwood	D. Miller	Ocean Fleets Ltd
Menelaus	6.2.89	B.N. Jones	B.R.G. Tasker, G.R. Cobb, A.N. Hamlett	R. Stevens	Ocean Fleets Ltd
Merchant Pioneer	11.11.87	J.R. Corrin	A.J.C. Braganza, R. Dabral, S.P.S. Rantela	A.N. Monserrate	V-Ships Ltd
Merchant Prelude	13.1.87	A. Zarniewicz	Z. Kusnierz	S.T. Sloczynski	V-Ships Ltd
Merchant Principal	19.5.88	J.R. Corrin	C.E. Mendonce, H.S. Shetty, T.S. Bajwa	N. Long	V-Ships Ltd
Merchant Purpose	19.1.89	H. McCole	J.E. McGregor, N.F. Alwood, C. Taylor	M.R. Palmer	V-Ships Ltd
Methane Princess	1.2.89	K.G. Maunder	T.P. Doherty, G. Campbell, U.C. Dockerty	G.M. Robinson	Shell Ship Management Ltd
Mobil Acme	27.2.89	K.J. Beverley	J.A. Horgan, I.J. Hockin, A. Smith	I.W. Barnes	Mobil Shipping Co. Ltd
Mobil Falcon	15.3.89	D.C. Kettletey	D.J. Brock, I. Appleby, A.J. Robinson	G.A. Evans	Mobil Shipping Co. Ltd
Mobil Petrel	8.12.88	J.H. Birchenough	D.H. Thackray, R.F. Walker, T.A. Butten	D. McSweeney	Mobil Shipping Co. Ltd
Monarch	14.3.89	R.J. Walter	G. Digby, M. Hammond, M.R. Swaffield	K. Woodley	British Telecom International
Montarik	10.2.89	W.F. Jeffrey	S.R. Ali, S.H. Haseeb, M.S.S. Tauni	Qureshi Zaheer-Ud-Din	Acomarit (U.K.) Ltd
Moraybank	14.12.88	W.H. Martin	E.F.S. Harrison, E.M. Pallister	J.D.C. Lawrie	Bank Line Ltd
Mulbera	8.7.87	A.J. Chivers	A.J. Brown, D.G. Robbie, M. Ellis	T. Baxter	Blue Star Ship Management Ltd
Napier Star	26.1.89	G. Bryson	J. Clarke, S.G. Mortimer, R. Gupthill	E. Cass	Blue Star Ship Management Ltd
Nassau Pride	3.6.88	G. Watson-Wood	E.J. Nichol, R.W. Thomson, R.G. Crozier	N. Smith	Graig Shipping plc
Naticina	14.3.89	A.T. Willy	A.F. Devanney, I.G. Falconer, S.J. Barnes	D. Fry	Shell Ship Management Ltd
Navious Unique	23.12.88	Kalia Mukesh	R. Khanna, R. Balasubramaniam, S.S. Rumde	G. Fernandes	Unique Shipping Agencies Ltd
Nedlloyd Tasman	3.2.89	A.C. McCulloch	A.P. Talbot, M.J. Trafford, P.R. Marriott	A. Titley	P. & O. Containers Ltd
Nickerie	6.2.89	E.M. Meare	E.R. Bruce, A. Bhagat, N.B. Solanki	R. Fernandes	E. & F. Ship Management Ltd
Nivaga II	6.7.88	P. Sione	H. Iele, O. Panapa, A. Tapeva		Government of Tuvalu
Nordic Link	19.1.89	J. McNeill	G.C. Hamilton, B. Standerline, M.J. Gee		Ship-Link (U.K.) Ltd
Norna	6.3.89	B.A. Hall	H.A. MacKenzie, M.C.J. Jewell, J.J. Coyle		Dept of Agr. & Fish. for Scotland
Norrisia	17.10.88	B. Cosgrove	J. Cornwall, G.D. Nicholls, J.R. Evans	G. MacDonald	Shell Ship Management Ltd
Norsea	*	D. Wharton	M. Topping, K. Appleton, P. May, D. Collins		North Sea Ferries Ltd
Nortank Fighter	*	B. Firth	P. Kohli Rajender, P. Malone, D. Bhathena Firdaus	A.F. Marques	Silver Line Ltd
Northern Explorer	28.1.87	M. Thomson	F.W. Brown, D. Farrington, I.A. Patterson	R. Boatman	Denholm Ship Management Ltd
Northern Horizon	*	P. Taylor	P. Garner, A. Fuller		J. Marr & Son Ltd
Northia	26.10.88	K. Fenwick	T.P. Doherty, J.R. Evans, G.A.P. Campbell	M. Collingwood	Shell Ship Management Ltd
Nosira Lin	28.2.89	J. Cooper	P. Bailey, B.M. Reilly, R. Gibson	C. Cupples	Bolton Maritime Management Ltd
Nosira Madeleine	19.1.89	M.A. Gater	P.W. Newton, D.S. Hibberd, D.R. Hilton	C.M. Jackson	Bolton Maritime Management Ltd
Nosira Sharon	22.12.87	S.F. Williams	S. Kembery, D.S. Hibberd, P.F. Goodchild	M.G. Finn	Bolton Maritime Management Ltd

Oakwood	17.11.88	E.R.T. Little	A. Hall, J.H. Bane, T.R.P. Dean	L.M. Campbell	Buries Markes (Ship Management) Ltd
Ocean Goose	3.8.88	D.A. Church			Capt. D.A. Church
Ocean Link	12.12.88	Olof Ottosson	A.H. Knutas, S. Lundberg, J.L. Rydell	A. Bystedt	Ship-Link (U.K.) Ltd
Oil Hustler	*	N. Brown	L. Elms		Ocean Inchcape Ltd
OOCL America	27.2.89	Cheng To Foo	Lui Hong Ngai, Wu Kou Di, Li Wai Man	Kou Shu Ching	Furness Withy (Shipping) Ltd
OOCL Atlantic	6.2.89	Wang Yung Chang	Chen Kuo Hsiung, Su Jeng Fang, Jwo Tien Fu		Furness Withy (Shipping) Ltd
OOCL Challenge	2.3.89	T.N. O'Driscoll	A. Ashurst	R. Gerstner	Orient Overseas Container Line Ltd
OOCL Europa	21.11.88	R.I.G. Calder	G.C. Claye, G. Shaw, A.G. Liversedge	J. Clark	Furness Withy (Shipping) Ltd
Orchid B	14.3.89	P.E. Jackson	D. Slade, J.D. Elsdon, P.K. Thakur	A. Knight	Beta Maritime Services Ltd
Ormond	8.12.88	D.F. Heaselden	K. Dhir, R.J. Gains, S.F. Ahmedi	I.D. Rodrigues	P. & O. Ship Management Ltd
Osaka Bay	22.12.88	J.D. Thomson	A.P. Baker, I.M. Chadney, P. Johnson	P. Mathews	P. & O. Containers Ltd
Osco Edmo	19.1.89	T.R. Mishra	B.K. Jha, A.P. Rath, J.S. Netto	B. Singh	B.C.P. Ship Management Ltd
Osco Macle	25.10.88	C.B. Kulkarni	G.L.S. Pinto	G. Dias	B.C.P. Ship Management Ltd
Pacheco	*	D.A. Saunders	D.J. Sweet, D. Warmington	.	Bank Line Ltd
Pacific Crane	14.11.88	A.G. Lacey	M. Light, T.T. Lunt, S.J. Fant	W.D. Scott	James Fisher & Sons plc
Pacific Guardian	31.7.85	P.R. Shaw	J.A. Tollady, W. Marr	S. Haslett	Cable & Wireless plc
Pacific Horizon	*	S. Morrell	G. Nowell, R. Boughen		J. Marr & Son Ltd
Pacific Pintail	22.11.88	G. Dodsworth	B.D. Miller, M. Morris, J. Sanderson	H. Chesters	James Fisher & Sons plc
Pacific Sandpiper	6.2.89	E. Griffin	G. Himsworth, J. Appleby, N. Turnbull	D. Drummond	James Fisher & Sons plc
Pacific Swan	17.11.88	J. M. Miller	J. Stafford, P. Ostick, T.I. Dixon	P. Austen	James Fisher & Sons plc
Pacific Teal	20.2.89	J. Miller	A.D. Cox, P.D. Sandison	D.P. Courtnadge	James Fisher & Sons plc
Pacific Universal	30.1.89	D. Forster	P.W. Hickery, R.G. Crozier, S. Bashkkaran	A.A. Samsilva	Matheson Shipping Services Ltd
Paquita	28.3.88	I. Lawson	P. Crowle		Sanders Stevens & Co. Ltd
Pegasus	20.6.86	Kaloudis Anastasios	Kossenas George	Kalodimos Kypiakos	Kappa (Maritime) Ltd
Perseus	*				Kappa (Maritime) Ltd
Petersfield	8.3.89	T. Forrest	R. Brough, G. Boobyer, D.S.R. De Alwis	P. Lacock	Buries Markes (Ship Management) Ltd
Pholas	29.3.88	C. Balderson	P.T. Clegg, L.D. Brown, P. Davis	G. North	Coe-Metcalf Shipping Ltd
Pointsman	28.1.87	R. Ord	D.A. Eagles, R.O.M. Low, J.D. Shelley	G.M. Duncan	Rowbotham Tankships Ltd
Pole Star	3.1.79	N. Morrison	W. Tullock, A.B. Welch		Northern Lighthouse Board
Princefield	2.3.88	J.F. Clapham	A.D. Chapman, K. Lindsay, A.G. Liyanage	W. Egalla	Buries Markes (Ship Management) Ltd
Profiler	5.1.89	H.J. Morrell	M. Pountain, R.C. Turner, M. Maines		Gardline Shipping Ltd
Providence Bay	12.1.89	W.F. McCarthy	J.R. Kennedy, M.D. Moore, M. Stewart	S.J. Braithwaite	P. & O. Containers Ltd
Puma	26.8.86	E. Wildgoose	D. McNaughton, J.T. Jamieson	P.D. Sutcliffe	P. & O. Ferries Ltd
Queen Elizabeth 2	21.12.88	R.A. Woodall	J.R. Gorman, J.H. Barwis, G.M. Starkey	A.W. Holmes	Cunard Ellerman Shipping Services Ltd
R.A. Emerson	8.11.88	R.B. Jones	D.F. Shepherd, S.R. Phalke, M.G. Aurora	Varghese Mathew	B.C.P. Ship Management Ltd
Rapana	5.1.89	D. Wallace	G.P. Donnelly, J.S. Mercer, I.C. Griffiths	R.I. Robson	Shell Ship Management Ltd
Ravenscraig	23.2.89	F. Stuart	B. Middleton, A. Crofts, P.W. Holliday	B. Prynn	Ropner Management Ltd
Reefer Jambu	16.8.88	C. Campbell	C.J. Meadows		Sembawang Shipping Co. (Pte) Ltd
Reefer Manggis	28.6.86	J. Hutton	K. Kristanssen, Wang Zhi Song, Su Wei Shun	Aye Maung Yin	Sembawang Shipping Co. (Pte) Ltd
Reefer Nangka	10.9.85	I.Y. Batley	Gwee Chwee Kim, M.J. Winterbottom, Chong Chee Meng	Lim Soo Hock	Sembawang Shipping Co. (Pte) Ltd
Regina Oldendorff	8.12.88	D. Lawrence	N. Abeysena, S. Verma, S. Karandikar	D. O'Donovan	Egon Oldendorff (H.K.) Ltd
Remuera Bay	6.2.89	A.A. Railton	J.L. Peterson, G.C. Smith, A.N. Murray	V.A. Gorny	P. & O. Containers Ltd
Repulse Bay	14.4.88	C.M. Satapathy	C.M. Patel, D.D. Nair, L.C. Rodrigues	P.K. Basu	Ocean Transportation S.A.
Researcher	30.9.87				Gardline Shipping Ltd
Resolution	21.5.87	L.M. Wigmore	J.W. Renson, A.J. Rawlinson		Gardline Shipping Ltd
Resolution Bay	20.1.89	R.T. Wood	C.C. Woodward, C.J. Batty, G.N. Hale	D.W. Ray	P. & O. Containers Ltd
Retriever	24.5.83	A. Venables	P.M. Swan, R.C. Phillips, J. Creach	D. Steel	Cable & Wireless plc
Rimula	17.11.88	J.L. Taylor	T.J. Downs, P. Brown, M.K. Jelfs	M.B. Bryan	Shell Ship Management Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Rizcun Atlantic	22.3.88	X.C. Gomez	S. Tiwari, A.K. Ghatak, A.S. Chabbra	P.L. Sequerra	Wisebrough Shipping Co. Ltd
Rocknes	18.5.88	A. Falconer	D. Cowell, C.S. Tinlay, J. Chapman	D. MacNeil	Jebsens Ship Management Ltd
Rollnes	11.2.88	A. Falconer	L.J. MacDonald, M.A.W. Brown	D.A. Logan	Jebsens Ship Management Ltd
Royal Princess	25.2.85	J.R. Young	N.P. Jenkins, J.A. Smith, J.A. Croft	W.J. Smith	P. & O. Ship Management Ltd
Rubens	11.11.87	M. Gater	A. Watkins, E. Miles, V.A. Egan	M.G. Finn	Bolton Maritime Management Ltd
St Clair	8.2.89	D.C. Gray	G. Gove, A.C.N. Wedge, J.S. Duncan	P.C.A. Enrico	P. & O. Ferries Ltd
St Helena	22.11.88	T.P. Dodkins	J.N.H. Case, M. Bray, J. Harrison	R.A. Wilson	Curnow Shipping Ltd
St Nicholas	20.3.89	B.C. Dennis	H.W. Ramsey, L.O. Roskell, D. Coombs	B.M. Keeling	Sealink (U.K.) Ltd
Sagacity	23.11.84	W.M. Shireff	H.R. Beisly, R. Volante		F.T. Everard & Sons Ltd
Safco Endeavour	*	E.R. Wooldridge	R. Telford, R. Harries, P. Almond	H.G. Pask	South Atlantic Fishing Co. Ltd
Salmonpool	15.10.86	R. Copeland	D. Lundy, S. Honey, L. Bridges	D. Bullard	Ropner Management Ltd
San Lorenzo	6.2.89	P.A. Woods	M.J. Stopford, R.R. Bijur, R. Raj Sharma	N.K. Jamade	B.C.P. Ship Management Ltd
Santa Marta	8.2.89	J.J. Millar	C.A. Tingay, J.R. Zamora, D.A. Espinoga	O.B. Viado	Denholm Ship Management Ltd
Santos Star	23.9.87	C. Bufton	R. Fitton, P. Buckley, A.M. Lee	I.C. Petrie	Blue Star Ship Management Ltd
Scamper Universal	27.2.89	I. Farquharson	R.A. Somerville, S.V. Perera, P.L. Cumaratunga	L.P.G. Jayatileke	Matheson Shipping Services
Scan Dutch Hondo	4.11.88	C.B. Walgate	M. Watts, N.M.V. Salmon, D. Rogers	P.I. Pegg	P. & O. Containers Ltd
Scirocco Universal	5.5.88	H.M. Jones	S.M.A. Akbar, D.P. Colley, K.M. Chester	N.S. Varty	C.I. Shipping Ltd
Scotia	3.3.82	G.M. Coull	J.E. Bannister, W.H. Laws, D. Dixon	J. Steven	Dept. of Agr. & Fish. for Scotland
Scottish Star	20.3.89	A.J. Chivers	J.P. Spencer, D.R. Johnston, C.W. Watson	J.R. Cowan	Blue Star Ship Management Ltd
Sea Princess	13.1.88	S.W. Townsend	F.S. Greenfield, S. West, A. Hayward	G. Chapman	P. & O. Ship Management Ltd
Sea Searcher	19.10.88	I.W. Crane	K. Scott, A.J. Rawlinson, T.D. Childs		Gardline Shipping Ltd
Seaboard Illustrious	6.11.84	J. Gillies	R. Crawford, A.F. Vincent, A.G. Maclean	C. Thompson	Seaboard Offshore Ltd
Seaboard Implacable	24.4.87	J.R. Brooks	D.J. MacLellan, F.W. Wilson, D.J. Massey		Seaboard Offshore Ltd
Seaboard Invincible	20.2.89	J.G. Smith	D. Morrison, N.G. Smith, T.T. Latto		Seaboard Offshore Ltd
Selectivity	*	T. Jeffrey	C. Winney		F.T. Everard & Sons Ltd
Semac I	28.8.80	J. Dobeson			Semac Services
Shell Explorer	9.2.89	D.J.G. Kain	J.M.G. Arthur, M.J.G. Garner, A.P. Vincent		Shell (U.K.) Ltd
Shetland Service	28.2.89	A.J. Clarke	D.E. Grief, N. Sheard, I. MacDonald		Zapata Offshore Marine Ltd
Silver Tower	20.2.89	D.J. Robinson	M. Haywood, C.X. Pinheiro, P. Thakur	C. Moors	Wallem S.M.S. (I.O.M.) Ltd
Singapore Senator	20.1.89	A.G. Moat	D. Dovedy	P.A. Onasis	B.C.P. Ship Management Ltd
Sky Clipper	9.2.89	D.R. Mountford	Z.D. Antia, C.A. Coutinho, M. Chopra	R. Pereira	E. & F. Shipping Management Ltd
Snow Crystal	5.10.88	G. Weaver	A.E. Hamill, J. Healy, A.J. Prinn	A. Cumming	Frigo Maris Shipping GMBH
Snow Flower	27.2.89	B. Yelland	G.A.W. Fink, M.R. Powell, J. Bore	A. Grant	Frigo Maris Shipping GMBH
Snowdon	26.1.89	P.J. Wild	J. Lacey, S. Puri, P. Ranjan	J.K. Bhadra	P. & O. Ship Management Ltd
Sociality	5.8.88	T.L. Hooper	A.W.R. Gibbons, B.A. McInally		F.T. Everard & Sons Ltd
Sonia M.	24.3.87	J. Pearsall	G.P. Eyles, G. Connick, M. Cox	E. Bromham	Cardiff Ship Management Ltd
Southland Star	31.8.88	A.J. Chivers	P.J. Newton, P.J. Brown, P.S. Sinclair	N. Marwood	Blue Star Ship Management Ltd
Speciality	24.5.88	T.K. Dawson	M.B. Roberts, M.S. King, M.W.T. McDowell		F.T. Everard & Sons Ltd
Stability	6.7.88	M.W. Salsbury	C.D. Spencer-Payne, K.G. Baldwin, M.W.T. McDowell		F.T. Everard & Sons Ltd
Staffordshire	16.12.88	F.R. Martin	C. Marsh, R. Oliver, M. Lacey	C. Wade	Bibby Line Ltd
Stainless Spray	16.3.88	J.H. Hirst	B. Stevenson, M.S. Chabba, J.W. Mampilly	J. McFarland	Turnbull Scott Management Ltd

Stena Carrier	*	N.B. Le Pine Williams	C. Atterton, G. Gardiner, J. Dyson	R. Clayton	Northern Marine Management Ltd
Stena Seawell	27.9.88				Stena Ltd
Stolt Surf	31.7.87	B.F. Hoare	P. Papango, C. Saberon	R. Bonus	Stolt-Nielsen Inc.
Strathbrora	8.12.88	B. Cushman	A.J. Ball, A.M. Leech, A.D. Bissell	A.D. Hutchinson	P. & O. Containers Ltd
Strider Juno	18.2.88	R. Forsyth	W.D. Garcia, W.A. Santos, R.A. Lora	M. Fancisco	Sea Containers Chartering Ltd
Suilven	19.8.88	J.N. MacDonald	M. MacLeod, C. Campbell, A. Morrison	S.O.J. Broady	Caledonian MacBrayne Ltd
Sulisker	23.11.88	D.K. Dickson	T. Collins, A.S.T. Beveridge, J.C. Barton		Ministry of Agriculture, Fisheries & Food
Sumburgh Head	9.2.89	R. Phillips	D.C. Selley, B. Pourakbari, A. Potter	R.A.S. MacMeikan	Chr. Salvesen Shipping Ltd
Sun Suma	29.2.88	D. MacKinnon	S. Prabhakar, L.T. Richards, Chan Ping Fai	M.L. Kershaw	Vermilion Overseas Mgmt Ltd
Swan River	*	B.V. Ström	E.A. Lopez, R.B. Manantan, T.I. Werner	P.C. Peneranda	Swan Shipping A/S
Swift Trader	14.12.88	W.C. Service	D.T. Pingel, R.J. Taylor		International Chartering Ltd
T.N.T. Lynx	12.4.88	A. Alexander	J. Hughes		T.N.T. Sealion Ltd
T.N.T. Sentinel	7.3.89	I.F. McRae	H.J. Pugh, R. Cox. J.J. Hughes	J.D. Cameron	T.N.T. Sealion Ltd
Taiwan Senator	6.12.88	W. Strevens	J.L. Mitchell, S. Douglas, K. Ball		Orient Overseas Container Line Ltd
Tankerman	9.12.86	R.G. Burnet	J.M. Walker, H.J. Pearce, D.A. Jackson	P. Kelly	Rowbotham Tankships Ltd
Tasman Universal	23.1.89	S. Venner	J. Wright, C.J. Garner, S.R.B.S. De Silva	J.T. Scott	Matheson Shipping Services
Telnes	15.8.86	D. Clements	D. Lloyd, M. Bailey	J. O'Driscoll	Jebsens Ship Management Ltd
Texaco Westminster	20.6.88	M.T. Hutton	D.S. Sadler, G.R. Snow, E.J. Cameron	I. Wilson	Texaco Overseas Tankships Ltd
Texaco Windsor	3.2.87	D.J. Vann	P.A. Hughes, E.M. Bower	T.J. Bailey	Texaco Overseas Tankships Ltd
Tokyo Bay	18.1.89	M.J.R. Godbehear	K. Worthington, R.T.M. Whelan, A.I. Jameson	J.A. Tomlinson	P. & O. Containers Ltd
Tolaga Bay	28.2.89	A.M. Barker	K.D. Campbell, N. Copeman-Mitchell, N.D.L. Gregory	E. MacKenzie (Mrs)	P. & O. Containers Ltd
Tor Bay	25.1.89	D.P. Worsop	K.S. Hardy, A.W. Pitcher, N.R. Hart	D.C. Thompson	P. & O. Containers Ltd
Tribulus	22.2.89	M. Geddes	C.S. Bull, M.J. Watts, K. Wyper	M.J. Hogan	Shell Ship Management Ltd
Tricula	2.3.89	D. Carrick	D. Freeman, B.R. Horsburgh, W.M. Barry	P.D. Hartwell	Shell Ship Management Ltd
Trinidad and Tobago	6.3.89	D.C.S. Farquhar	A.M. Clifton, D.C. Gilbert, J.V. Farray	P.N. Pouchet	Bibby Line Ltd
Valdivia	20.1.89	J.D. Dickinson	S.A. Francis, G. Shaw, M. Rickaby	G.J. Hulse	Harrison (Clyde) Ltd
Venassa	24.11.88	M.H. Rich	D.F. Cammish, A.G. Cable, I. Kendall	D. McCallum	Shell Ship Management Ltd
Vic Bilh	20.2.89	G.J. Stevens	W.G. Dickinson, A.W. Divekar, P.V. Ogg	J.M. Byrne	Fairfield-Maxwell Services Ltd
Victoria Peak	9.1.89	J. Chalmers	G.H. Lowis, M. Thorley, D. Galloway	W. Abeki	Seahorse Ship Management Ltd
Victus	20.9.88	P.K. Sen	H.M. Soanes, A. Kapoor, I.J. Singh	G.S.R. Iyengar	Barber Ship Management Ltd
Vigilant	9.1.89	D.L. Rattray	D.W. Temple, T. Collins, .R.J. Sheldon		Dept of Agriculture & Fisheries for Scotland
Viking Valiant	20.10.88	M. Edward	J.E. Birdsall, L.T. Simpson, D.A. Parsons	E.S. Scott	P. & O. Ferries Ltd
Viking Venturer	6.10.88	C.E. Banks	J. Nixon, J.W. Trickett, A.J. Gorringe		P. & O. Ferries Ltd
Viking Viscount	1.12.87	M. Edward	M.L. Bechley, J.R. Warton, P.A. Marcon	B.C. Bull	P. & O. Ferries Ltd
Viking Voyager	7.1.88	C. Walford	D.A. Parsons, P.D. Meyerhoff, S. Townsend		P. & O. Ferries Ltd
Vivian M	5.1.89	N.W. Thomas	G. Henderson, M. Ahmed, S. Mehta	N.A. Orpe	E. & F. Shipping Management Ltd
Washington	12.8.87	J.N. Ramsey	J. Wilson, K. Whittaker, D.D. Matheson	K. Whytock	Stephenson Clarke Shipping Ltd
Wellington Star	19.12.88	T.C. Black	A. Tibbot, P.A. Duggie, P. Khan	G. Gibbon	Blue Star Ship Management Ltd
West Moor	9.3.89	R.H. Lancaster	A.C. Dunnings		Denholm Ship Management Ltd
Westfield	9.3.89	M.N. Baddeley	W.L.F.K. Lansakara		Buries Markes (Ship Management) Ltd
Westra	6.1.83	T. Henderson	D.L. Beveridge, R.J. Sheldon		Dept of Agr. & Fish. for Scotland
Wheelsman	17.11.86	P.J. Jameson	J. Whitford	A.F. Clifford	Rowbotham Tankships Ltd
Zenatia	30.1.89	J. Warman	P. Jeffery, J. Blake, R.E. Wade	D. Cowhig	Shell Ship Management Ltd

'Marid' Ships

The following is a list of ships recruited for the observing and reporting of sea temperatures from the coastal waters of Great Britain. Masters are requested to point out any errors or omissions from the lists.

Name of Vessel	Master	Owners/Manager
Arco Thames	P.H. Phillips	A.R.C. (Marine) Ltd
Ashington	R. Francis	Stephenson Clarke Shipping Ltd
Authenticity	J. McKay	F.T. Everard & Sons Ltd
B.P. Jouster	W.J.S. Coulter	B.P. Oil Ltd
B.P. Warrior	R.G. Rait	B.P. Oil Ltd
Barra Head	P.J. Keane	Christian Salvesen (Shipping) Ltd
Beckenham	A. Rees	Bowker & King Ltd
Bowcross	S. Isaacs	British Dredging Aggregates Ltd
Clymene	E.A. Jones	Furness Withy (Shipping) Ltd
Craigallian	W. Broadley	J. & A. Gardner Ltd
Eastgate	M. Corner	Rowbotham Tankships Ltd
Emerald	K. Whittaker	Stephenson Clarke Shipping Ltd
Esso Avon	F. Clayton	Esso Petroleum Co. Ltd
Esso Clyde	C.C. Jorgensen	Esso Petroleum Co. Ltd
Esso Fawley	J. Wilson	Esso Petroleum Co. Ltd
Esso Mersey	J.H. Smith	Esso Petroleum Co. Ltd
Esso Milford Haven	D.W. Ling	Esso Petroleum Co. Ltd
Esso Tenby	J.A. Thorne	Esso Petroleum Co. Ltd
Frederick M	W.P. Jones	Coe-Metcalf Shipping Ltd
Gladonia	D. Pingel	Runwave Ltd
Guidesman	—	Rowbotham Tankships Ltd
Harting	J. McCuaig	Stephenson Clarke Shipping Ltd
Helmsman	D. Roberts	Rowbotham Tankships Ltd
Hoveringham I	R. Hemmings	United Marine Dredgers Ltd
Irishgate	T. Frith	Rowbotham Tankships Ltd
Jubilence	J.E. Herbert	Crescent Shipping Ltd
Kindrence	A.J. Affleck	Crescent Shipping Ltd
La Colina	J. Doody	Buries Markes (Ship Management) Ltd
La Hacienda	D. Kelly	Buries Markes (Ship Management) Ltd
La Predera	—	Buries Markes (Ship Management) Ltd
Malling	M.F. Berne	Stephenson Clarke Shipping Ltd
Militence	D. Jeffreys	Crescent Shipping Ltd
Norgas Venture	A.J. Lewis	Silver Line Ltd
Northgate	B. Wilson	Rowbotham Tankships Ltd
Oilman	S. Mahoney	Rowbotham Tankships Ltd
Orionman	A.W. Duffin	Rowbotham Tankships Ltd
Piquence	—	Crescent Shipping Ltd
Rora Head	J.B. Kerr	Christian Salvesen (Shipping) Ltd
St Brendan	N. Brown	Sealink (U.K.) Ltd
St Columba	—	Sealink (U.K.) Ltd
Shell Craftsman	M. Fraser	Shell (U.K.) Ltd
Shell Trader	G. Wright	Shell (U.K.) Ltd
Storrington	P.R. Thompson	Stephenson Clarke Shipping Ltd
Vibrence	J. Setterfield	Crescent Shipping Co. Ltd
Warden Point	G.C. Relton	Hudson S.S. Co. Ltd
Westgate	A. Everett	Rowbotham Tankships Ltd

Light-vessels

Name of Vessel	Master
Channel	P. Newland, C. Woods
Dowsing	L.A. Horn, J. Elsom
Royal Sovereign (Lt Tower)	V.S. Pearce, P. Stafford

Oil Rigs and Platforms

Name of Rig or Platform	Owners/Operators
Beatrice A	B.P. Pet. Development Ltd
Benlomond	Atlantic Drilling Co. Ltd
Benvreoch	Atlantic Drilling Co. Ltd
Benvrackie	Atlantic Drilling Co. Ltd
Beryl B	Mobil North Sea Ltd
Clyde A	B.P. Pet. Development Ltd
Deep Sea Pioneer	Hamilton Brothers Oil & Gas Ltd
Dixilyn Field 96	Sonat Offshore Ltd
Dixilyn Field 97	Sonat Offshore Ltd
Dunlin A	Shell U.K. Exploration & Production Ltd
F.G. McClintock	Reading & Bates Ltd
Glomar Arctic 3	Global Marine Ltd
Heather A	Unionoil Co. of G.B. Ltd
M.G. Hulme Jnr	Reading & Bates Ltd
Montrose A	Amoco (U.K.) Exploration Ltd
Morecombe Bay (API)	Hydrocarbons (G.B.) Ltd
Santa Fe 140	Santa Fe (U.K.) Ltd
Sea Explorer	B.P. Pet. Development Ltd
Sedneth 701	Sedco-Forex
Thistle A	B.P. Pet. Development Ltd
Western Pacesetter IV	Western Oceanic (U.K.) Ltd

BRITISH COMMONWEALTH

The following lists give the names of Selected and Supplementary Ships, and the number of Auxiliary Ships where known (i.e., those which only report in 'sparse areas'), which voluntarily co-operate with meteorological services of the British Commonwealth *Information for these lists is required by 31 March each year. Information for the January corrective lists is required by 30 September each year.*

AUSTRALIA (Information dated 16.2.89)

Name of Vessel	Owners/Manager
Selected Ships:	
Abel Tasman	TT Line Tasmania
Al Khaleej	Livestock Transport & Trading Co. K.S.C.
Al Qurain	Livestock Transport & Trading Co. K.S.C.
Al Shuwaikh	Livestock Transport & Trading Co. K.S.C.
Al Yasrah	Livestock Transport & Trading Co. K.S.C.
Anro Australia	Australian National Line
Arafura	Overseas Containers Australia Pty Ltd
Ariake I	Overseas Containers Australia Pty Ltd
Arwa	Wallem Ship Management Ltd
Australian Advance	Australian National Line
Australian Escort	Australian National Line
Australian Exporter	Australian National Line
Australian Progress	Australian National Line
Australian Prospector	Australian National Line
Australian Purpose	Australian National Line
Australian Spirit	B.P. Australia Ltd
Australian Trader	Australian National Line
Australian Venture	Australian National Line
B.P. Achiever	B.P. Australia Ltd
B.P. Enterprise	B.P. Australia Ltd
Baltimore Jupiter	Stateships
Bass Trader	Australian National Line
Brahman Express	Vroon B.V. Breskens
Buffalo Express	Vroon B.V. Breskens
Canopus	Howard Smith Industries Pty Ltd
Cape Don	Department of Transport
Cape Moreton	Department of Transport
Cape Pillar	Department of Transport

Australia *(contd)*

Name of Vessel	Owners/ Manager
Coral Chief	China Nav. Co. Ltd
Danny F	Rachid Fares Enterprises Pty Ltd
Eigamoiya	Nauru Local Govt Council
Eigigu	Nauru Local Govt Council
El Borrego	Italcattle Spa Bari (Italy)
El Cordero	Cugado Shipping Co. S.A.
El Redil	Livestock Carriers Bari (Italy)
Enegy Searcher	Maretech
Fernanda F	Oceanic Shipping S.A.R.L.
Flamingo Bay	Mr D. Tomlinson
Franklin	C.S.I.R.O.
Fua Kavenga	Pacific Forum Line
Hanne Bakke II	Knutsen Offshore (Panama) S.A.
Howard Smith	Howard Smith Industries Pty Ltd
Icebird	Antarktic and Spegial
Ilongo	Weeke Ship Hong Kong Ltd
Irene Greenwood	Stateships
Iron Arnhem	Broken Hill Pty Co. Ltd
Iron Capricorn	Broken Hill Pty Co. Ltd
Iron Kembla	Broken Hill Pty Co. Ltd
Iron Kestrel	Broken Hill Pty Co. Ltd
Iron Kirby	Broken Hill Pty Co. Ltd
Iron Newcastle	Broken Hill Pty Co. Ltd
Iron Pacific	Broken Hill Pty Co. Ltd
Iron Prince	Broken Hill Pty Co. Ltd
Iron Sturt	Broken Hill Pty Co. Ltd
Iron Whyalla	Broken Hill Pty Co. Ltd
Island Gas	Broken Hill Pty Co. Ltd
Jabiru Venture	Broken Hill Pty Co. Ltd
Jon Sanders	Stateships
Klang Reefer	Sea Containers Ltd
Koolinda	Stateships
Kowulka	C.S.R. Ltd
Lady Franklin	C.A. Crosbie Shipping Co.
Lindesay Clark	Howard Smith Industries Pty Ltd
Mahsuri	Blue Star Line
Mary Durack	Stateships
Mawashi Al-Gasseem	Saudi Livestock Transport & Trading Co.
Mawashi Tabuk	Saudi Livestock Transport & Trading Co.
Mobil Flinders	Mobil Oil Australia Ltd
Nimos	China Nav. Co. Ltd
Nivosa	Shell Co. of Australia Ltd
Ormiston	C.S.R. Ltd
Papuan Chief	China Nav. Co. Ltd
Pathfinder II	Pan-Ore Transportation Inc.
Pilbara	Stateships
Portland	Havard Smith Industries Pty Ltd
Rig Seismic	Bureau of Mineral Resources
River Boyne	Australian National Line
River Embley	Australian National Line
River Torrens	Australian National Line
Seaway Hobart	Union S.S. Co. Australia
Sedco B.P. 471	Overseas Drilling Ltd
Sid McGrath	John Burke Shipping
Soela	C.S.I.R.O.
Swan Reefer	Sea Containers Ltd
TNT Altrans	T.N.T. Bulkships Ltd
TNT Capricornia	T.N.T. Bulkships Ltd
TNT Carpentaria	T.N.T. Bulkships Ltd
Tourcoing	Scan Austral Asiatic Shipping Line
Troubridge	Govt of State of South Australia
Uniceb	Livestock Carriers Bari (Italy)
Wyuna	Australian Maritime College
Zincmaster	T.N.T. Bulkships Ltd
Supplementary Ships:	
Iron Carpentaria	Broken Hill Pty Co. Ltd
Iron Curtis	Broken Hill Pty Co. Ltd
Iron Monarch	Broken Hill Pty Co. Ltd
Iron Shortland	Broken Hill Pty Co. Ltd
Iron Spencer	Broken Hill Pty Co. Ltd
Neptune Seginus	Neptune Orient Lines

Auxiliary Ships:
Australia has 5 Auxiliary Ships currently reporting.

CANADA (Information dated 1.1.88)

Name of Vessel	Owners/Manager
ASL Sanderling	ASL Atlantic Searoute Ltd
Ad Astra	Barber Ship Management Ltd
Advent	Government of Canada
Alberni Dawn	Man Cheung Yuen Services Ltd
Alert	Government of Canada
Algobay	Algoma Central Railway Inc.
Ann Harvey	Canadian Coast Guard
Arctic	Canarctic Shipping Co. Ltd
Astron	Tarros Ventures (NFLD) Ltd
Atlantic Wing	ACT Maritime Co. Ltd
Baffin	Government of Canada
Bartlett	Canadian Coast Guard
Bayfield	Government of Canada
Beiner	Marine Institute of Newfoundland
Bergen Arrow	Jardine Ship Management Ltd
Bibi	Sir William Reardon Smith & Sons
Bluenose	Canadian National (Marine)
Brierfield	Buries Markes (Ship Management) Ltd
Bunga Kantan	Malaysian International Shipping Corp.
C.S.L. Innovator	Canadian Steamship Lines Co. Ltd
Calga	BCP Ship Management Co. Ltd
Canadian Ace	Montreal Shipping Ltd
Cape Brier	Government of Canada
Cape Roger	Government of Canada
Chebucto	Government of Canada
Chennai Nermai	South India Shipping Corporation Ltd
Chennai Polivu	South India Shipping Corporation Ltd
Citadel Hill	Barber Ship Management Ltd
Coastal Canada	Soconan Inc.
Cygnus	Government of Canada
Dawson	Government of Canada
Des Groseillers	Canadian Coast Guard
Earl Gray	Government of Canada
Eastern Maid	Indo-China S.N. Co. Ltd
Edward Cornwallis	Canadian Coast Guard
Elso	BCP Ship Management Co. Ltd
F.C.G. Smith	Government of Canada
Federal Maas	Federal Commerce Co. Ltd
Fort Kamloops	Canadian Pacific Steamships Ltd
Fort Nanaimo	Canadian Pacific Steamships Ltd
Fort Yale	Canadian Pacific Steamships Ltd
F.P. Clipper	East Asiatic Co. Ltd
Friendship	Friendship Carrier Inc.
Fuhwo Venture	Indo-China S.N. Co. Ltd
G.B. Reed	Government of Canada
George E. Darby	Government of Canada
George R. Pearkes	Government of Canada
Goldensari Indah	Unknown
Great Jade	World-wide Shipping Agency Ltd
Great Pearl	World-wide Shipping Agency Ltd
Great Prize	Wak Tung Shipping Co. Ltd
Grena	Jardine Ship Management Ltd
Grenfell	Government of Canada
Harmac Dawn	Man Cheung Yuen Services Ltd
Henry Larsen	Canadian Coast Guard
Hudson	Government of Canada
Irving Arctic	Kent Lines Ltd
Irving Canada	Kent Lines Ltd
Irving Eskimo	Kent Lines Ltd
Irving Forest	Kent Lines Ltd
Irving Ocean	Kent Lines Ltd
Island Princess	P. & O. Lines Ltd
J.C. Phillips	Sofati Soconau
J.E. Bernier	Canadian Coast Guard
Jackman	Canadian Coast Guard
James Sinclair	Government of Canada
John A. Macdonald	Canadian Coast Guard
John Cabot	Government of Canada
John P. Tulley	Government of Canada
Kemano Saga	Jardine Ship Management Ltd
Leonard J. Cowley	Government of Canada

Canada *(contd)*

Name of Vessel	Owners/Manager
Limnos	Government of Canada
Lofines	Jebsen Ship Management Ltd
Louis M. Lauzier	Navmar Corp.
Louis S. St Laurent	Canadian Coast Guard
Louisburg	Government of Canada
Lucien Paquin	Logistic Navigation Co. Ltd
Maris Villander	Husky/Bow Valley Offshore Drilling Ltd
Martha L. Black	Government of Canada
Mary Hichens	Government of Canada
Maxwell	Government of Canada
Nahidik	Government of Canada
Namao	Government of Canada
Nandu Arrow	Jardine Ship Management Ltd
New Zealand Alliance	New Zealand Line
Nordglimt	Norden Steamship Co. Ltd
Nordkyn	Norden Steamship Co. Ltd
Norman McLeod Rogers	Canadian Coast Guard
Pacific Princess	P. & O. Lines Ltd
Pandora II	Government of Canada
Panther	Unique Shipping Agencies Ltd
Parizeau	Government of Canada
Pierre Radisson	Canadian Coast Guard
Portland Carrier	Northeastern Offshore Services
Practician	Ocean Tramping Co. Ltd
Princess of Acadia	Canadian National (Marine)
Quedoc	Halco Inc.
Queen of Prince Rupert	British Columbia Ferry Corp.
Queen of the North	British Columbia Ferry Corp.
Raven Arrow	Indo-China S.N. Co. Ltd
Rimba Maranti	Malaysian International Shipping Corp.
Royal Princess	P. & O. Lines Ltd
Samuel Risley	Canadian Coast Guard
Sedco 710	Petro Canada
Simon Fraser	Government of Canada
Sir Humphrey Gilbert	Canadian Coast Guard
Sir James Douglas	Government of Canada
Sir John Franklin	Canadian Coast Guard
Sir Wilfred Grenfell	Canadian Coast Guard
Sir Wilfred Laurier	Canadian Coast Guard
Sir William Alexander	Government of Canada
Skeena	Reardon Smith Lines Ltd
Star Everwin	Man Cheung Yuen Services Ltd
Star Florida	Univan Ship Management Co. Ltd
Star Fraser	Univan Ship Management Co. Ltd
Star Hong Kong	World-wide Shipping Co. Ltd
Star Magnate	Marine Navigation Co. Ltd
Star Sulu	Vinta Maritime Co. Ltd
Summerfield	Buries Markes (Ship Management) Ltd
Sun Maya	Fuji Shipping Co. Ltd
Sun Princess	P. & O. Lines Ltd
Sun Rokko	Gearbulk Shipping Agency Ltd
Tanu	Government of Canada
Thomas Carleton	Government of Canada
Thor I	Thor Dahl Lines
Thorscape	Thor Dahl Lines
Trudy	Souter Shipping Ltd
Tsekoa II	Government of Canada
Tupper	Government of Canada
Vector	Government of Canada
Western Valley	Reardon Smith Lines Ltd
W.E. Ricker	Government of Canada
Wilfred Templeman	Government of Canada
William	Government of Canada
W.M. Vacyash	Shell Canadian Tankers Co. Ltd
Wolfe	Canadian Coast Guard
Yankee Clipper	Hapag-Lloyd Shipping Co. Ltd

Auxiliary Ships:

Canada has 239 ocean-going Auxiliary Ships and 123 Auxiliary Ships operating on the Great Lakes and inland waters.

HONG KONG (Information dated 31.3.89)

Name of Vessel	Owners/ Manager
Selected Ships:	
Acacia	Mercury Shipping Co. Ltd
Als Dedication	Ahrenkiel Shipping (H.K.) Ltd
Als Prosperity	Ahrenkiel Shipping (H.K.) Ltd
Arrow Pride	Jardine Ship Management Ltd
Asian Jade	Mercury Shipping Co. Ltd
Asian Pearl	China Navigation Co. Ltd
Avelona Star	Concordia Marine Co. Ltd
Barber Perseus	Barwil Agencies Ltd
Barber Tampa	Barwil Agencies Ltd
Boonkrong II	Chin Seng Hong Ltd
Brooklyn Bridge	'K' Line Kawasaki (H.K.) Ltd
Bunga Kantan	Mak Shui Cho & Son Ltd
Bunga Suria	Mak Shui Cho & Son Ltd
C.R. Abidjan	Wallem Shipping (H.K.) Ltd
C.R. Douala	Wallem Shipping (H.K.) Ltd
C.R. Pointe Noire	Wallem Shipping (H.K.) Ltd
Chengtu	China Navigation Co. Ltd
Coral Princess	China Navigation Co. Ltd
Eastern Harmony	Mitsui O.S.K. Lines (H.K.) Ltd
Eriskay	China Navigation Co. Ltd
Fair Bridge	Ocean Tramping Co. Ltd
Gallantry	China Merchants Shipping & Enterprises Co. Ltd
Gonosan	Unique Shipping Agencies Ltd
Hawk Arrow	Jardine Ship Management Ltd
Hong Kong Container	Island Navigation Corporation International Ltd
Hunan	China Navigation Co. Ltd
Jebsen Tauranga	Kristian Jebsens Ltd
Kweilin	China Navigation Co. Ltd
Maersk Semakau	Maersk Line (H.K.) Ltd
Mah IV	Chin Seng Hong Ltd
Maritime Bravery	International Maritime Carriers Ltd
Maritime Champion	International Maritime Carriers Ltd
Maritime Express	International Maritime Carriers Ltd
Maritime Gardenia	International Maritime Carriers Ltd
Maritime Goliath	International Maritime Carriers Ltd
Maritime Hibiscus	International Maritime Carriers Ltd
Maritime Joy	International Maritime Carriers Ltd
Maritime Loyalty	International Maritime Carriers Ltd
Maritime Noble	International Maritime Carriers Ltd
Maritime Star	International Maritime Carriers Ltd
Maritime Success	International Maritime Carriers Ltd
Maritime Wisdom	International Maritime Carriers Ltd
Morning Grace	Wing Tak Shipping Agency Ltd
Musing	Ocean Tramping Co. Ltd
New Oasis	Wing Tak Shipping Agency Ltd
Ocean Elite	Wing Tak Shipping Agency Ltd
Ocean Pearl	Pearl Cruises Catering (H.K.) Ltd
Ocean Sincerity	Wing Tak Shipping Agency Ltd
Ocean Strength	Wing Tak Shipping Agency Ltd
OOCL Advance	Orient Overseas Container Line Ltd
OOCL Ambition	Orient Overseas Container Line Ltd
OOCL Fair	Orient Overseas Container Line Ltd
OOCL Faith	Orient Overseas Container Line Ltd
OOCL Fortune	Orient Overseas Container Line Ltd
OOCL Freedom	Island Navigation Corporation International Ltd
Oriental Ambassador	Orient Overseas Container Line Ltd
Oriental Chief	Island Navigation Corporation International Ltd
Oriental Executive	Orient Overseas Container Line Ltd
Oriental Expert	Orient Overseas Container Line Ltd
Oriental Explorer	Orient Overseas Container Line Ltd
Osprey Arrow	Jardine Ship Management Ltd
Pacific Container	Miltrend Shipping Ltd
R.R. Ratna	Orient Overseas Container Line Ltd
Raya Glory	Ocean Tramping Co. Ltd
Raya Happiness	Ocean Tramping Co. Ltd
Red Sea Pioneer	Barber Ship Management Ltd
Shensi	Jardine Ship Management Ltd
Tokyo Bridge	'K' Line Kawasaki (H.K.) Ltd
Willine Orient	Jardine Shipping Agencies (H.K.) Ltd

Hong Kong *(contd)*

Name of Vessel	Owners/Manager
Supplementary Ships:	
Admiralty Island	Miltrend Shipping Ltd
Halldor	Thoresen Shipping Ltd
Hallvard	Thoresen Shipping Ltd
Hugheverett	Everett Steamship Corporation S/A
Island Container	Miltrend Shipping Ltd
Jebsen Napier	Kristian Jebsens Ltd
Jebsen Timaru	Kristian Jebsens Ltd
Johneverett	Everett Steamship Corporation S/A
Maersk Tauro	Maersk Line (H.K.) Ltd
Manoloeverett	Everett Steamship Corporation S/A
Maritime Faith	International Maritime Carriers Ltd
Maritime Triumph	International Maritime Carriers Ltd
Maritime Victory	International Maritime Carriers Ltd
Oriental Knight	Orient Overseas Container Line Ltd
Oriental Patriot	Orient Overseas Container Line Ltd
Sea Architect	Interocean Shipping Co. Ltd
Seamaster I	Interocean Shipping Co. Ltd
Silver Clipper	Valles Steamship Co. Ltd
Success Bulker	Valles Steamship Co. Ltd
Thomaseverett	Everett Steamship Corporation S/A
World Ranger	World-wide Shipping Agency Ltd

Auxiliary Ships:

Hong Kong also has 1 Auxiliary Ship currently reporting.

INDIA (Information dated 1.1.89)

Name of Vessel	Owners/Manager
Selected Ships:	
Akbar	Shipping Corporation of India Ltd
Andamans	Shipping Corporation of India Ltd
B.R. Ambedkar	Shipping Corporation of India Ltd
Bharatendu	Shipping Corporation of India Ltd
Chennai Selvam	South India Shipping Corp. Ltd
Gaveshani	National Institute of Oceanography
Harshavardhan	Shipping Corporation of India Ltd
Jala Jyoti	Scindia Steam Navigation Co. Ltd
Jala Moti	Scindia Steam Navigation Co. Ltd
Jala Yamini	Scindia Steam Navigation Co. Ltd
Lokmanya Tilak	Shipping Corporation of India Ltd
Ratna Nandini	Ratnakar Shipping Co.
Sagar Kanya	Shipping Corporation of India Ltd
Sagar Sampada	Shipping Corporation of India Ltd
Samudra Manthan	Geological Survey of India
State of Andhra Pradesh	Shipping Corporation of India Ltd
State of Nagaland	Shipping Corporation of India Ltd
Vishnu Sagar	Parekh Ocean Carriers
Supplementary Ships:	
A.B. Tarapore	Shipping Corporation of India Ltd
APJ Anand	APJ Lines Ltd
APJ Angad	APJ Lines Ltd
APJ Anjali	APJ Lines Ltd
APJ Priya	APJ Lines Ltd
APJ Shalin	APJ Lines Ltd
APJ Sushma	APJ Lines Ltd
Aditya Usha	Century Shipping Co.
Alakanda	Shipping Corporation of India Ltd
Arunachal Pradesh	Shipping Corporation of India Ltd
Lt Arun Khetrapal PVC	Shipping Corporation of India Ltd
Bhagat Singh	Shipping Corporation of India Ltd
Bharat Seema	Shipping Corporation of India Ltd
Bhavbhuti	Shipping Corporation of India Ltd
Chandidas	Shipping Corporation of India Ltd

India *(contd)*

Name of Vessel	Owners/ Manager
Chennai Jayam	South India Shipping Co. Ltd
Chennai Muyarchi	South India Shipping Co. Ltd
Chennai Polivu	South India Shipping Co. Ltd
Chennai Sadhanai	South India Shipping Co. Ltd
Chennai Valarchi	South India Shipping Co. Ltd
Chennai Veeram	South India Shipping Co. Ltd
Chhatrapati Shivaji	Shipping Corporation of India Ltd
Dadabhai Naoroji	Shipping Corporation of India Ltd
Dakshineshwar	Shipping Corporation of India Ltd
Diglipur	Shipping Corporation of India Ltd
Dweep Setu	Shipping Corporation of India Ltd
FONJ Shekon PVC	Shipping Corporation of India Ltd
Ganga Sagar	Shipping Corporation of India Ltd
Guru Bachhan Singh	Shipping Corporation of India Ltd
Hardwar	Shipping Corporation of India Ltd
Harkishan	Shipping Corporation of India Ltd
Havildar Abdul Hamid	Shipping Corporation of India Ltd
Homi Bhabha	Shipping Corporation of India Ltd
Indian Endurance	India Steamship Co.
Indian Explorer	India Steamship Co.
Indian Faith	India Steamship Co.
Indian Fame	India Steamship Co.
Indian Fraternity	India Steamship Co.
Indian Freedom	India Steamship Co.
Indian Goodwill	India Steamship Co.
Indian Grace	India Steamship Co.
Indian Industry	India Steamship Co.
Indian Progress	India Steamship Co.
Indian Prosperity	India Steamship Co.
Indian Triumph	India Steamship Co.
Indian Valour	India Steamship Co.
Indian Venture	India Steamship Co.
INS Kripan	Naval ship
Jag Anjali	Great Eastern Shipping
Jag Dharma	Great Eastern Shipping
Jag Doot	Great Eastern Shipping
Jag Jeevan	Great Eastern Shipping
Jag Krishi	Great Eastern Shipping
Jag Manek	Great Eastern Shipping
Jag Pari	Great Eastern Shipping
Jag Prakesh	Great Eastern Shipping
Jag Preeti	Great Eastern Shipping
Jag Rekha	Great Eastern Shipping
Jag Skakti	Great Eastern Shipping
Jag Shanti	Great Eastern Shipping
Jag Vijay	Great Eastern Shipping
Jagat Samrat	Dempo Steamship Co. Ltd
Jagat Swamini/ Priyamvada	Dempo Steamship Co. Ltd
Jagat Vijeta	Dempo Steamship Co. Ltd
Jala Bala	Scindia Steam Nav. Co. Ltd
Jala Gauri	Scindia Steam Nav. Co. Ltd
Jala Godavari	Scindia Steam Nav. Co. Ltd
Jala Mohan	Scindia Steam Nav. Co. Ltd
Jala Mokambi	Scindia Steam Nav. Co. Ltd
Jala Moti	Scindia Steam Nav. Co. Ltd
Jala Mudra	Scindia Steam Nav. Co. Ltd
Jala Murugan	Scindia Steam Nav. Co. Ltd
Jala Japi	Scindia Steam Nav. Co. Ltd
Jala Vallabh	Scindia Steam Nav. Co. Ltd
Jala Vijaya	Scindia Steam Nav. Co. Ltd
Jameela	M/s. Ghosh & Co.
Jana Priya	Shipping Corporation of India Ltd
Jay Ambika	Jayshree Shipping Co.
Jay Laxmi	Jayshree Shipping Co.
Jay Narayan Vyas	Shipping Corporation of India Ltd
Kabirdas	Shipping Corporation of India Ltd
Kalidas	Shipping Corporation of India Ltd
Kanchan Junga	Shipping Corporation of India Ltd
Kanpur	Shipping Corporation of India Ltd
Kolandia	Shipping Corporation of India Ltd
Lance Naik Albert Ekka	Shipping Corporation of India Ltd
Lok Maheshwari	Shipping Corporation of India Ltd
Lok Manya	Shipping Corporation of India Ltd
Lok Preeti	Shipping Corporation of India Ltd

India *(contd)*

Name of Vessel	Owners/Manager
Lok Rajeshwari	Shipping Corporation of India Ltd
Lok Vikas	Shipping Corporation of India Ltd
Lok Vinya	Shipping Corporation of India Ltd
Lok Vivek	Shipping Corporation of India Ltd
MMP Wealth	MMP Lines
Maharshi Dayanand	Shipping Corporation of India Ltd
Maharshi Karve	Shipping Corporation of India Ltd
Mandakini	Shipping Corporation of India Ltd
Maratha Elegance	Chowgule Shipping Co.
Maratha Melody	Chowgule Shipping Co.
Maratha Prudence	Chowgule Shipping Co.
Meghdoot	Varun Shipping Co.
Meghrab	Indo Oceanic Shipping Co.
Mizoram	Shipping Corporation of India Ltd
Murshidabad	Shipping Corporation of India Ltd
Naik Jadunath Singh PVC	Shipping Corporation of India Ltd
Nand Hari	Essar Bulk Carriers
Nand Kala	Essar Construction & Essar Bulk Carriers
Nand Kavita	Essar Construction & Essar Bulk Carriers
Nand Nidhi	Essar Construction & Essar Bulk Carriers
Nand Kishore	Essar Construction & Essar Bulk Carriers
Nand Rati	Essar Construction & Essar Bulk Carriers
Netaji Subhash Bose	Shipping Corporation of India Ltd
Nirvan Vishnu	Nirvan Shipping Co.
Nitya Amar	Nirvan Shipping Co.
Onge	Shipping Corporation of India Ltd
Patliputra	Shipping Corporation of India Ltd
A-Prabhu Gopal	Tolani Shipping Co.
B-Prabhu Puni	Tolani Shipping Co.
Prabhu Daya	Tolani Shipping Co.
Prabhu Satram	Tolani Shipping Co.
Rafi Ahmed Kidwai	Shipping Corporation of India Ltd
Ramdas	Shipping Corporation of India Ltd
Ratna Kirti	Ratnakar Shipping Co.
Ratna Shobhana	Ratnakar Shipping Co.
Ratna Vandana	Ratnakar Shipping Co.
Ravidas	Shipping Corporation of India Ltd
Sagar Deep	Shipping Corporation of India Ltd
Sai Nanak	TPS Shipping Co.
Samarat Ashok	Shipping Corporation of India Ltd
Samudra Jyoti	Paint Ocean Carriers
Sarojini Naidu	Shipping Corporation of India Ltd
Satya Murti	Shipping Corporation of India Ltd
Skandy Surveyor	Dept. of Ocean Development
State of Gujarat	Shipping Corporation of India Ltd
State of Haryana	Shipping Corporation of India Ltd
State of Madhya Pradesh	Shipping Corporation of India Ltd
State of Manipur	Shipping Corporation of India Ltd
State of Orissa	Shipping Corporation of India Ltd
Subhedar Joginder Singh	Shipping Corporation of India Ltd
Teesta	Mackinnon & Mackenzie Co.
Tulsidas	Shipping Corporation of India Ltd
Unibaksh	Universal Shipping Co.
Uttar Kashi	Shipping Corporation of India Ltd
Vallabhbhai Patel	Shipping Corporation of India Ltd
Varanasi	Shipping Corporation of India Ltd
Varuna Adhar	Thakur Shipping Co.
Vishva Abha	Shipping Corporation of India Ltd
Vishva Aditya	Shipping Corporation of India Ltd
Vishva Ajay	Shipping Corporation of India Ltd
Vishva Ambar	Shipping Corporation of India Ltd
Vishva Asha	Shipping Corporation of India Ltd
Vishva Karuna	Shipping Corporation of India Ltd
Vishva Kaumudi	Shipping Corporation of India Ltd
Vishva Madhuri	Shipping Corporation of India Ltd
Vishva Mohini	Shipping Corporation of India Ltd
Vishva Nandini	Shipping Corporation of India Ltd
Vishva Nayak	Shipping Corporation of India Ltd
Vishva Pallav	Shipping Corporation of India Ltd
Vishva Pankaj	Shipping Corporation of India Ltd
Vishva Parag	Shipping Corporation of India Ltd
Vishva Parijat	Shipping Corporation of India Ltd

India *(contd)*

Name of Vessel	Owners/Manager
Vishva Parimal	Shipping Corporation of India Ltd
Vishva Shakti	Shipping Corporation of India Ltd
Vishva Shobha	Shipping Corporation of India Ltd
Vishva Siddhi	Shipping Corporation of India Ltd
Vishva Tarang	Shipping Corporation of India Ltd
Vishva Umang	Shipping Corporation of India Ltd
Vishva Vikram	Shipping Corporation of India Ltd
Vishva Yash	Shipping Corporation of India Ltd
Vishwesharayya	Shipping Corporation of India Ltd
Vivekananda	Shipping Corporation of India Ltd
Yerawa	Shipping Corporation of India Ltd
Zakir Hussain	Shipping Corporation of India Ltd

Auxiliary Ships:

India also has a fleet of 35 Auxiliary Ships currently reporting.

NEW ZEALAND (Information dated 1.2.89)

Name of Vessel	Owners/Manager
Selected Ships:	
ACT 3	Blue Port ACT (N.Z.) Ltd
ACT 4	Blue Port ACT (N.Z.) Ltd
ACT 5	Blue Port ACT (N.Z.) Ltd
Amokura	Union Maritime Services Ltd
Aotea	Crusader Swire Container Service
Auckland Express	Tasman Express Line
Canterbury Express	Tasman Express Line
Capitaine Tasman III	Sofrana Unilines
Cordella	Skeggs Fisheries
Daniel Solander	Solander Fisheries Ltd
Fijian	Reef Shipping Agencies
Forum Samoa	Pacific Forum Line
Golden Bay	Golden Bay Shipping Co.
Gondwana	Greenpeace N.Z. Inc.
Greenfield	Wallem Ship Management
Holmdale	Union Maritime Services Ltd
James Cook	N.Z. Government (Fisheries Research)
Jebsen Tauranga	Jebsen N.Z. Ltd
Kaharoa	Fisheries Research Division
Kotuku	Union Maritime Services Ltd
Kuaka	Union Maritime Services Ltd
Mandama	Blue Port ACT (N.Z.) Ltd
N.Z. Mariner	N.Z. Line
Pacific Ariki	Swire Pacific Offshore Marine/SBPT
Rapuhia	DSIR/Union Maritime Services Ltd
Smit Lloyd 104	Smit Lloyd Offshore Marine/SBPT
Spirit of Competition	Pacifica Shipping Co.
Spirit of Freedom	Pacifica Shipping Co.
Taiko	Union Maritime Services Ltd
Tarahiko	N.Z. Line
Tasman Enterprise	Tasman Pulp & Paper Co. Ltd
Tasman Venture	Tasman Pulp & Paper Co. Ltd
Tui Cakau III	Sofrana Unilines
Union Auckland	Union Maritime Services Ltd
Union Endeavour	Union Maritime Services Ltd
Union Rotoiti	Union Maritime Services Ltd
Union Rotorua	Union Maritime Services Ltd
Westport	N.Z. Cement Holdings Ltd
Willwatch	Sealord Products
Supplementary Ships:	
Arahanga	New Zealand Railways
Arahura	New Zealand Railways
Aratika	New Zealand Railways

Auxiliary Ships:

New Zealand has a fleet of 12 Auxiliary Ships currently reporting.

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